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Treasa Delaney[1], Laura Castillo[2], Maximillian A. Friehs[1, 3, 4], Benjamin Buttlar[2], and Ciara M. Greene[1]

[1] School of Psychology, University College Dublin
[2] Department of Social Psychology, University of Trier
[3] Psychology of Conflict Risk and Safety, Department of Technology Human and Institutional Behaviour, Faculty of Behavioural Management and Social Sciences, University of Twente
[4] Lise-Meitner Research Group Cognition and Plasticity, Max-Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany

People are prone to forming false memories for fictitious events described in fake news stories. In this preregistered study, we hypothesized that the formation of false memories may be promoted when the fake news includes stereotypes that reflect positively on one's own nationality or negatively on another nationality. We exposed German and Irish participants ($N = 1,184$) to fabricated news stories that were consistent with positive or negative stereotypes about Germany and Ireland. The predicted three-way interaction was not observed. Exploratory follow-up analyses revealed the expected pattern of results for German participants but not for Irish participants, who were more likely to remember positive stories and stories about Ireland. Individual differences in patriotism did not significantly affect false memory rates; however, higher levels of cognitive ability and analytical reasoning decreased false memories and increased participants' ability to distinguish between true and false news stories. These results demonstrate that stereotypical information pertaining to national identity can influence the formation of false memories for fake news, but variations in cultural context may affect how misinformation is received and processed. We conclude by urging researchers to consider the sociopolitical and media landscape when predicting the consequences of fake news exposure.

Public Significance Statement
Recent decades have seen a sharp increase in the quantity of misinformation or "fake news" available online. When people are exposed to fake news, they can come to believe in or even remember the events described in the fake stories, with potential consequences for democracy and international relations. Stereotypes entail vivid knowledge about how members of particular groups are expected to behave. We therefore expected that stereotypes might affect people's responses to fake news. In this study, we presented German and Irish participants with fake news stories that reflected either positive or negative stereotypes about Germany and Ireland. Many participants did form false memories or beliefs for the fake news stories, but a different pattern of results was observed for each nationality. This suggests that misinformation might be processed differently by different groups of people and that cultural context should be considered when investigating the impact of fake news.

Ciara M. Greene ![ORCID] https://orcid.org/0000-0002-8833-9046

Although misinformation in the media is not a new phenomenon, the digitization of news and rise of social media has led to a sharp increase in the amount of inaccurate information being circulated (Vosoughi et al., 2018). This has led to concerns about potential harms for society, including damage to democratic systems and international relations (Farkas & Schou, 2019). The term "fake news" has become a widely used catchphrase, employed both to identify misinformation and to deride uncongenial or politically inconvenient information (Lazer et al., 2018). A variety of other terms are also used to describe this kind of online content; for example, we may distinguish between *misinformation* (essentially, any information that is incorrect) and *disinformation*, which has the additional connotation of intentional dissemination with the intent to deceive (Wardle & Derakhshan, 2018). Thus, in the public eye, fake news can encompass both misinformation and disinformation, depending on the context and content of the message.

Within a research context, information can be categorized as "fake news" if it meets the criteria of low facticity, creation with the intention to deceive, and a journalistic format (Egelhofer & Lecheler, 2019). The concept has generated a considerable amount of literature, mainly focused on the spread of fake news, understanding why people fall for misinformation, and developing techniques to reduce its effects (Sindermann et al., 2020). Recent research has shown that, when exposed to fake news stories, people can come to believe in and even form memories for these fabricated events, especially if they confirm our preexisting beliefs (Greene et al., 2021; Murphy et al., 2019). Stereotypes represent a set of beliefs about the world and can affect how we process information about different social or ethnic groups. In the present study, we ask whether stereotypes relating to people's nationality influence the formation of false memories for fake news.

False Memories

The distortion of memory arising from exposure to misleading information has been termed the "misinformation effect" (Loftus, 2005). A substantial body of research has been developed that demonstrates impairment in memory produced by exposure to misinformation. For instance, people have misremembered hammers as screwdrivers (Loftus, 1975), stop signs as yield signs (Loftus, 1979), and have even recalled nonexistent items, such as broken glass at the site of a car crash (Loftus & Palmer, 1974). False memories have been shown to influence an individual's subsequent thoughts, intentions, and behaviors (Laney & Loftus, 2017). Given this, and the explosion of misinformation in the form of fake news (Vosoughi et al., 2018), it is imperative to understand what factors underlie the formation of a false memory for a fake news story.

The source-monitoring framework (Johnson et al., 1993) provides a comprehensive explanation of false memory formation. A central tenet of the source-monitoring approach is that when a memory is retrieved, its source is not directly specified by an abstract tag or label. Rather, it is inferred through two different judgment processes, working in tandem: a faster, heuristic and a slower, systematic process. The first process is based on judgments regarding the qualitative characteristics of the mental event, such as associated emotional reactions and perceptual, temporal, and spatial detail (Mitchell & Johnson, 2000). For example, memories for perceived events tend to be more vivid and include more contextual and perceptual detail than memories that arise from imagination.

Therefore, when a memory for an imagined event feels extremely vivid and familiar, heuristic judgments may result in an incorrect source attribution, whereby the imagined event is believed to be real (Henkel & Coffman, 2004). For instance, the use of doctored images of a fabricated event may enhance the perceptual detail of the mental representation of the event, causing an incorrect heuristic judgment (Wade et al., 2002).

The second system involves more systematic and strategic processes. This more deliberate judgment process tends to be slower and involves retrieval of supporting memories, general knowledge, and reasoning. Research has shown that plausibility is an important factor in the creation of false memories (Scoboria et al., 2004), although what individuals believe to be plausible can be shaped by their existing knowledge and preconceptions. For instance, Frenda et al. (2013) found that liberal Americans were more likely to falsely remember a negative scandal about George Bush, while conservative Americans were more likely to falsely remember a negative scandal involving Barack Obama. Similarly, a study examining false memories for fake news during the Irish abortion referendum revealed that participants intending to vote "Yes" in the referendum were more likely to falsely remember a fabricated scandal regarding the "No" campaign, while "No" voters were more likely to falsely remember a fabricated scandal regarding the "Yes" campaign (Murphy et al., 2019). Participants' preexisting views led them to believe that the "other side" was capable of nefarious activity and predisposed them to falsely remember the fictitious event.

Heuristic and systematic judgment processes work in parallel and can provide checks on each other. A memory that has passed a heuristic check due to its high vividness may be challenged by systematic processes and discarded based on implausibility. On the other hand, an individual may evaluate the plausibility of a fictitious story in light of their preexisting schemas, world views, and knowledge and determine it to be true (Greene et al., 2021). Thus, false memories are likely to be formed for the events described in fake news stories when source-monitoring judgments are skewed.

Stereotypes and Memory

The source-monitoring framework implies that stereotypes play an important role when making source attributions for memories. Prior social knowledge, in the form of schemas, categories, or stereotypes, may influence the encoding, storage, and retrieval of social information (Cohen, 1981). A stereotype is a "cognitive representation of the ideas, facts, and images that are associated with a social group" (Lenton et al., 2001). Stereotypes can produce expectations regarding how members of different social groups will behave. As a result, stereotypes about individuals may act as heuristic cues when making a source attribution. Research suggests that people are particularly likely to rely on stereotypes as judgment heuristics when cognitive demands are high (Sherman & Bessenoff, 1999).

Reliance on stereotype knowledge as source-monitoring cues can often lead to misattributions. For instance, an eyewitness may misattribute a crime to the incorrect person because it appears more congruent with their beliefs about ethnicity or gender. Bodenhausen (1988) reported that participants who were aware of a Hispanic defendant's ethnicity before they read the evidence regarding the crime recalled more incriminating than exonerating details, compared to when they were unaware. Another study examined

whether gender stereotypes affected source-monitoring decision processes and found that stereotypically inconsistent actions performed by an actor (e.g., a man folding baby clothes or a woman fixing household appliances) were more likely to be misattributed to a stereotypically consistent actor (Kleider et al., 2008). These results highlight the influence that social stereotypes can have on making source attributions for memories and suggest that stereotypically consistent misinformation may lead to a higher rate of false memories than information that does not fit the stereotype.

Social Identity: In-Groups, Out-Groups, and Nationality

Social identity theory (Tajfel & Turner, 1979) was developed to elucidate the nature of intergroup relations. Across a series of experiments, Tajfel and his colleagues demonstrated that mere categorization into a social group results in high in-group identification, in-group bias, and intergroup differentiation (e.g., Billig & Tajfel, 1973; Turner, 1985). Underlying social identity theory are two premises: First, that individuals come to define themselves by the groups with which they identify; and second, that individuals strive for a positive self-concept and self-evaluation. To achieve a positive evaluation of oneself, one must also positively evaluate the groups to which one belongs. Therefore, social identity motivates group members toward thoughts and actions that maintain a positive distinction between their group and other relevant out-groups (Hornsey, 2008). According to social identity theory, it is this process that underlies instances of in-group differentiation and out-group derogation and supports the development of stereotypes (Haslam et al., 1999).

Social and partisan identity can therefore often be the main driver behind attitude formation and various forms of judgment. Social identity goals can lead to motivated reasoning, whereby individuals will, for example, attend to information that aligns with their identity and disregard information that does not (Bolsen et al., 2014; Kahan, 2016; Schaller, 1992). This extends to a tendency to believe information—and misinformation—that is ideologically congruent (Kahan, 2017; Van Bavel & Pereira, 2018) and may also explain why people are more susceptible to forming false memories for fake news stories that are congruent with their political identity (e.g., Frenda et al., 2013; Murphy et al., 2019). This effect can operate even with relatively recently formed identities, such as one's position as a "Leaver" or "Remainer" in the 2016 Brexit referendum (Greene et al., 2021).

It seems reasonable to infer that national identity may operate in a similar way to political identity, in that people may be more liable to forming false memories for stereotypically consistent fake news. Specifically, we might expect people to "remember" stories that reflect positive stereotypes of their own nation (the in-group) and negative stereotypes of another nation (the out-group). The effects of ideological congruency may depend on the strength of commitment to the ideological identity: A recent study showed that the more positive a participant's attitude toward feminism, the more likely they were to falsely remember a fake news story that reflected positively on feminism, and vice versa (Murphy et al., 2021). Thus, the tendency to falsely remember stereotypically consistent fake news stories that support a positive national identity might be moderated by the individual's degree of identification with their nationality.

Patriotism, defined as "a sense of positive identification and feelings of affective attachment to one's country" (Schatz et al., 1999), is undeniably one of the most salient forms of group attachment in modern society. Staub (1997) distinguished between two relational orientations of patriotism: *blind patriotism* is characterized as a rigid and unquestioning allegiance to one's nation, combined with intolerance of criticism, whereas *constructive patriotism* refers to an attachment to one's country that is defined by "critical loyalty" (Schatz et al., 1999), whereby citizens may question or criticize the actions of the group with the goal of encouraging positive change. Both blind and constructive patriotism have been linked to positive evaluations of the in-group nation. The two manifestations of patriotism differ, however, in their attitude toward out-groups. Blind patriotism has been linked to negative feelings toward multiculturalism and immigration (Spry & Hornsey, 2007). In contrast, people high in constructive patriotism are less concerned with the differences between their own nation and others (Staub, 1997) and tend to provide more favorable evaluations of out-groups (Willis-Esqueda et al., 2017).

If patriotism tends to encourage out-group derogation, the construct of identification with all humanity (IWAH) should have the opposite effect. IWAH reflects the extent to which people feel close to and care for human beings all over the world and is associated with valuing the lives of in-group and out-group members equally, concern for humanitarian needs, and globalism (McFarland et al., 2012, 2019). IWAH is negatively correlated with blind patriotism, ethnocentrism (McFarland et al., 2012), and many specific prejudices (Dunwoody & McFarland, 2018; McFarland et al., 2019). Thus, measures of blind and constructive patriotism and IWAH may be expected to have distinct effects on the tendency to form false memories that align with national identity.

The various theories outlined above all converge on the prediction that people will be especially likely to form false memories for information that aligns with past experience (including knowledge of stereotypes) and casts the participant's in-group in a positive light.

Cognitive Factors Affecting False Memory Formation

Along with the social factors described in the previous section, a number of cognitive variables have been associated with susceptibility to false information. In general, low levels of intelligence have been linked with a greater susceptibility to misinformation (Zhu et al., 2010), and false memories for politically congruent fake news have been shown to be higher among those with low levels of cognitive ability (Murphy et al., 2019). These findings may be explained under the umbrella of the source-monitoring framework: Individuals with fewer cognitive resources available will struggle to monitor the source of incoming information and may have more difficulty forming a detailed mental model of the world against which the new information can be compared (Greene et al., 2020). Intelligence is also correlated with a reduction in prejudice and stereotypical beliefs (Hodson & Busseri, 2012; Wodtke, 2016). Thus, more intelligent participants may be less prone to falsely remembering stereotype-consistent information.

The tendency to form false memories for fake news may also be predicted by an individual's reasoning style. According to the classical reasoning account, it is a lack of engagement with deliberative processes that causes people to believe misinformation

(Ross et al., 2021). Individuals who are inclined to reason analytically may be more likely to rely on systematic (rather than heuristic) source-monitoring processes and therefore more likely to reject information that simply "feels" true but has no basis in fact. Indeed, several studies have demonstrated that individuals with higher scores on a measure of analytical reasoning style are less likely to believe, share, or form false memories for fake news stories (e.g., Greene & Murphy, 2020; Pennycook & Rand, 2019). Since the preferential formation of false memories for ideologically congruent information may be driven at least in part by a reliance on heuristic processes, more analytical participants might also be expected to be less susceptible to stereotypically consistent fake news stories.

The Present Study

The aim of the present study was to investigate the role of national identity and cognitive ability in the formation of false memories for fake news related to national stereotypes. The majority of fake news studies to date have been conducted within a single national and cultural context, most often in the United States. Culture can, however, have drastic effects on social cognition (Nisbett & Masuda, 2003; Vogeley & Roepstorff, 2009), so it is important to establish whether effects observed in one context generalize to another. This study was a collaboration between University College Dublin and Trier University and therefore compared false memories among Irish and German participants. Participants were presented with positively or negatively valenced fake news stories that reflected common stereotypes about German and Irish people, along with a series of neutral, true stories. After each news story, participants' memory for the events depicted in the story was assessed. Our preregistered hypotheses were that:

1. Participants would be more likely to form false memories for fake news stories that reflect positive stereotypes of their nationality, compared to another nationality.

2. Participants would be more likely to form false memories for news stories that reflect negative stereotypes of another nationality, compared to their own nationality.

In line with our preregistration, we also investigated whether the effects of participant nationality, emotional valence of story, and story nationality were moderated by the following variables: (a) analytical reasoning, as measured by the Cognitive Reflection Test (CRT); (b) IQ, as measured by the nine-item version of the Raven's Progressive Matrices (RPM-9); (c) blind and constructive patriotism; and (d) scores on the Identification With All Humanity (IWAH) scale.

Method

Design

This was a 2 × 2 × 2 mixed-design study with two between-subjects variables—participant nationality (German or Irish) and story valence (positive or negative)—and one within-subjects variable—the nationality referred to in the story. Each participant viewed two fake stories (one about German people and one about Irish people), which reflected either positive or negative national stereotypes, along with four neutral, true stories. The study

protocol was approved by the Human Research Ethics Committee (Humanities) of University College Dublin.

Transparency and Openness

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study. All data and research materials are available at https://osf.io/jv48c/. This study's design and analysis were preregistered at https://aspredicted.org/5SL_7FT. We preregistered a sample size of 1,300 based on the results of a power analysis in G*Power 3.1 (Faul et al., 2007) for the primary analysis in this article, namely a binomial logistic regression: 1,302 participants were required to detect small–medium effects (odds ratio of 1.25) with 80% power and an α level of 0.05.

Participants

In total, 1,364 participants were recruited to the study via personal networks ($n = 110$), Trier University student pool ($n = 169$), and Prolific—an online crowdsourcing platform ($n = 1,085$). Prolific participants were paid £1.70 on completion of the study. Participants were required to be 18 years or older and of Irish or German nationality. In line with our preregistration, participants who failed two or more attention checks were excluded from analysis ($n = 180$). Our final sample ($N = 1,184$) fell slightly short of our preregistered sample size as a result of a higher-than-expected number of exclusions following attention checks, and we were unable to replace these participants due to a shortage of funding. The sample consisted of 577 (48.7%) Irish people and 607 (51.3%) German people, with a mean age of 32.58 years ($SD = 11.09$, range = 18–81). Participants reported their sex as male ($n = 389$), female ($n = 775$), and other ($n = 13$); seven participants declined to answer.

Materials

Selection of Stereotypes

Two separate pilot studies were carried out to identify the most widely held stereotypes about German and Irish people.

We began by identifying common stereotypes about German and Irish people via brief brainstorming sessions with a small number of people of both nationalities. We then compiled a long list of approximately 25 stereotypes about each nationality, including both positive and negative characteristics (e.g., "German people are punctual," "German people are inflexible," "Irish people are friendly," "Irish people are alcoholics"). See online materials for the full list of the stereotypes. Participants who identified as either Irish or German nationals were then recruited via Prolific and completed a brief online survey ($n = 100$; 50 Irish people, 50 German people; 40 male, 58 female, two nonbinary/other; $M_{age} = 33.93$ years, $SD = 11.61$). Participants completed the survey in either German or English, as appropriate. The research team included multiple native speakers of English and German. Translations from English to German and vice versa were done by the respective native speakers of the research team and cross-checked by other members. Participants were presented with the lists of Irish and German stereotypes in counterbalanced order and asked to indicate what percentage of people in society they think believe each stereotype to be true. With the same list of stereotypes,

participants were then asked to indicate to what extent they believed each stereotype to be positive or negative about the targeted nationality, on a scale from 0 (*very negative*) to 100 (*very positive*).

A second open-ended pilot study was conducted in which a different set of participants ($n = 40$; 20 German people, 20 Irish people; 15 male, 25 female; $M_{age} = 30.05$ years, $SD = 11.29$) were asked to provide five positive and five negative adjectives that described the average German or Irish person. Semantically similar responses (e.g., "drink too much," "always drunk," "alcoholics") were grouped together, and the frequency of each positive and negative stereotype was calculated. The data for both pilot studies may be found online at https://osf.io/jv48c/.

The stereotypes selected for use in the main study were ones that appeared in both the closed- and open-ended surveys, allowing for differences in wording. We chose stereotypes that were rated at the extremes of the valence scale (how positive/negative the stereotypes were perceived to be, $0 =$ *very negative*, $100 =$ *very positive*) and received high ratings for commonness (percentage of people participants thought believed the stereotype). Based on these criteria, the stereotypes selected for German people were *German people are efficient* (valence: $M = 82.78$, $SD = 14.9$; commonness: $M = 78.26\%$, $SD = 16.36$) and *German people are overly bureaucratic* (valence: $M = 28.81$, $SD = 21.85$; commonness: 69.47%, $SD = 23.56$). The stereotypes chosen for Irish people were *Irish people are hospitable* (valence: $M = 86.72$, $SD = 14.19$; commonness: $M = 75.55\%$, $SD = 17.71$) and *Irish people are alcoholics* (valence: $M = 15.29$, $SD = 17.96$; commonness: $M = 55.41\%$, $SD = 29.40$).

It was not possible to perfectly match both valence and commonness ratings while also ensuring the inclusion of stereotypes that were volunteered in the open-ended pilot. Thus, the selected positive and negative Irish stereotypes were respectively rated as being slightly more positive, $t(98) = 2.42$, $p = .02$, $d = 0.24$, and more negative, $t(91) = -5.51$, $p < .001$, $d = -0.57$, than their German counterparts. Critically, the negative stereotypes were rated as significantly more negative than the positive stereotypes for both nationalities, with a large effect size, Irish: $t(94) = 25.75$, $p < .001$, $d = 2.64$; German: $t(94) = 7.78$, $p < .001$, $d = 1.82$. There was no difference in commonness ratings of the positive stereotypes, $t(98) = 1.33$, $p = .19$, $d = 0.13$, but the Irish negative stereotype was rated as less common than the German stereotype, $t(98) = 3.60$, $p < 001$, $d = 0.36$. The Irish negative stereotype ("Irish people are drunks/alcoholics") was, however, the most commonly reported negative stereotype in the open-ended pilot, suggesting that this concept was easily accessible for both German and Irish participants. Importantly, we do not make any claims here that the selected stereotypes are perfect mirrors of each other, just that they are commonly held conceptions about the nationalities in question.

Fabricated Stories

Four fabricated stories were created that were all related to the ongoing COVID-19 pandemic (see Figure 1). The inclusion of photographs with fake news stories can increase the construction of false memories by implying that there are multiple sources for the information contained in the news story, even if the photograph is of no probative value (Garry et al., 2007; Newman et al., 2012; Strange et al., 2011). Each news story

was, therefore, presented in a short written summary and accompanied by a nonprobative stock photograph (an image of a pub or a surgical mask and antigen test). Online research was conducted to ensure that the events described in our false stories had not actually occurred or been reported by the media. These stories were pilot tested with 40 participants, who did not participate in our main research study, to verify their plausibility and to ensure that the fabricated events reflected either positively/negatively on the nationality in question. Participants in the pilot study were informed that some headlines might be untrue. The positive and negative German stories did not significantly differ in plausibility from their Irish counterparts, and the positive stories were rated as significantly more positive than the negative stories (see https://osf.io/jv48c/ for data).

True Stories

Four true stories relating to news events across Europe were shown to participants. The news stories were presented in the same format as the fake stories, with a short description and an accompanying illustration. The four true news stories were as follows:

1. The European Commission has stated an intention to classify atomic and gas energy as climate friendly. Robert Habeck, German minister for economy and energy, calls that "greenwashing."

2. There was outrage among the Irish public as a group of over 20 officials at the Department of Foreign Affairs celebrated Ireland's election to the United Nations Security Council with a champagne party during strict Covid restrictions.

3. During the Taliban takeover of Afghanistan in 2021, the first German military plane to arrive in the country rescued only seven refugees, despite being designed to carry more than 100 people. "The small number is due to the fact that the situation on the ground was extremely unstable" reported the German crisis unit.

4. More than 5 million refugees have fled Ukraine since Russia began its invasion. Most Ukrainian refugees have crossed into Poland, and others have gone to Romania, Hungary, Moldova, Slovakia, and other European countries.

Patriotism

Patriotism was assessed using the Blind and Constructive Patriotism Scale (Cohrs, 2003; Rothi et al., 2005; Schatz et al., 1999). By nature of the scale topic, the items are tied to a specific nationality and consequently, not each item from the original scale can be used in other contexts (e.g., "The anti-Vietnam war protesters were un-American"). The present study relied on the overlap between the adaption of the scale for the German (Cohrs, 2003) and the British (Rothi et al., 2005) contexts. This scale uses 12 items to assess blind and constructive patriotism. Seven items assess blind patriotism (e.g., "I would support my country right or wrong"), while five items assess constructive patriotism (e.g., "I express my love for Ireland/Germany by supporting efforts for

Figure 1
The Four Fabricated News Events Used in the Study

German Positive

Efficient German engineering has been praised for ensuring schools received state-of-the-art air filtering systems just in time for the new Omicron wave of the COVID-19 pandemic.

German Negative

German bureaucracy has been blamed for nearly 20,000 excess COVID deaths, as red tape prevented the installation of air filters and hand sanitizers in schools.

Irish Positive

During the initial stages of the COVID-19 pandemic, Irish MEPs were praised for pushing through a €10 billion package to prevent job losses in the tourism industry, emphasising "values of hospitality and cosmopolitanism".

Irish Negative

Pub-culture in Ireland was left unrestricted for a long time despite the critical course of the pandemic. In the early months of the pandemic, 70% of super-spreader events were traced to events in pubs.

Note. MEPs = Members of the European Parliament. See the online article for the color version of this figure.

positive change"). Participants indicate their attitudes on a 6-point scale from –3 (*disagree strongly*) to +3 (*agree strongly*) with no zero point. The blind patriotism and constructive patriotism constructs both showed good reliability (Cronbach's α = .80 and .74, respectively).

IWAH

The IWAH scale consists of 9 three-part items, in which participants are asked to reflect on the extent to which the item applies to people in their community, people of the same nationality, and all humans everywhere. The scale was adapted to refer to Irish or German people as appropriate and was translated into German using the same approach outlined above. For example, the first item reads, "How much do you identify with (that is, feel a part of, feel love toward, have concern for) each of the following? a. People in my community; b. Irish/German people [as appropriate] c. All humans everywhere." Participants respond on a 5-point scale, where higher scores indicate a stronger sense of identification. A measure of IWAH is obtained by summing responses to the c. ("all humans everywhere") items. This scale showed excellent reliability in the present sample (α = .84).

Cognitive Ability

Cognitive ability was assessed using a nine-item version of RPM-9 (Bilker et al., 2012). The RPM-9 is a shortened form of the 60-item Raven's Standard Progressive Matrices (RSPM; J. C. Raven, 1938). The psychometric properties of the RSPM have been thoroughly analyzed (J. Raven, 1989), and it is one of the most widely used assessments for general intelligence. One significant limitation of the RSPM is the amount of time required to complete the full set of items. The RPM-9 comprises a carefully selected subset of items from the RSPM (Items A12, B12, C4, C12, D7, D12, E1, E5, and E10), with difficulty increasing with each successive item. Each item consists of a geometric design in the form of a matrix, with a missing piece. Subjects must identify the piece that completes the pattern from either six or eight options provided. The RPM-9 shows an excellent correlation with scores from the 60-item RSPM ($r = .98$) and provides 75% administration time savings (Bilker et al., 2012).

Analytic Reasoning

The CRT is a widely used instrument designed to measure a person's ability to override an intuitive, incorrect response and to engage in further deliberation that leads to the correct answer.

A sample question is "If it takes five machines 5 min to make five widgets, how long would it take 100 machines to make 100 widgets?" The intuitive answer is 100 min; the correct answer is 5 min. CRT scores have been shown to correlate strongly with Scholastic Aptitude Test scores, time preference, and belief bias (Frederick, 2005). Although the CRT correlates highly with measures of general intelligence, research shows that the CRT is a particularly powerful measure of the tendency toward miserly processing (Toplak et al., 2011). The original CRT (Frederick, 2005) comprised three items that required numerical reasoning. More recently, a seven-item version (CRT-2, Thomson & Oppenheimer, 2016) has been produced that includes four additional nonnumerical questions (e.g., "If you're running a race and you pass the person in second place, what place are you in?"). One question in this version did not translate well from English to German and was therefore excluded ("Emily's father has three daughters. The first two are named April and May. What is the third daughter's name?"). We, therefore, employed a six-item CRT in the present study; higher scores (out of a maximum of 6) indicate a stronger tendency toward analytical reasoning. The six-item scale showed very good reliability in this sample ($\alpha = .70$).

The full survey with all measures may be found in online materials at https://osf.io/jv48c/.

Procedure

Data collection began on July 9, 2022, and ended on August 16, 2022. Data were collected via the online survey platform Qualtrics. Participants first indicated their nationality (Irish or German) and completed the remainder of the study, including the informed consent process, in either English or German, as appropriate. In the introduction to the survey, participants were informed that the aim of this research was to "investigate people's attitudes to different news events across Europe." They were not informed that misinformation would be presented in the survey. Participants provided consent and answered a series of demographic questions (age, gender, education, political orientation). Participants were randomly assigned to view either positively valenced or negatively valenced fake news stories about both Ireland and Germany.

The presentation order of study elements was counterbalanced, such that participants first completed either the CRT, IWAH, RPM-9, and Patriotism scales (presented in random order) or responded to the six news stories (four true and two fabricated, also presented in random order). Participants who had been assigned to the positively valenced condition viewed the positive German story and the positive Irish story, while participants in the negatively valenced condition viewed the negative German story and the negative Irish story. All participants viewed the same four true, neutral stories. See Figure 2 for an illustration of the study procedure.

After viewing each news story, participants were asked, "Do you remember this event?" and selected from the following response options: "I remember seeing/hearing about this," "I don't remember seeing/hearing about this, but I remember it happening," "I don't remember this, but I believe it happened," "I remember this differently," or "I don't remember this." These options were provided in order to allow participants to discriminate between *remembering* an event and merely *believing* that it happened. Participants were then asked, "If you do remember this event, how did you feel about it at the time?" and could respond in an open-ended text box. After viewing all six news stories, participants were presented with thumbnail images and brief descriptions of the stories they had seen. They were asked to indicate on a scale of 0–100 how truthful they believed each story to be (0 = *definitely not true*,

Figure 2
Schematic of the Experimental Procedure
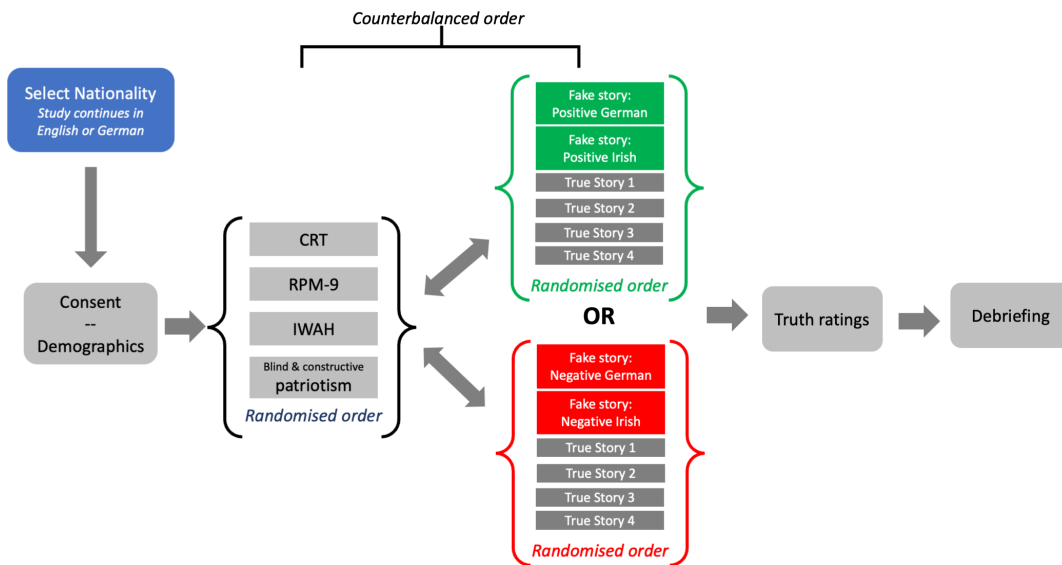
Note. Participants were randomly assigned to view positively or negatively valenced news stories and responded to the true and fake stories and a set of standardized questionnaires in counterbalanced order, before rating the truthfulness of all stories and being debriefed. CRT = Cognitive Reflection Test; RPM-9 = Raven's Progressive Matrices; IWAH = Identification With All Humanity. See the online article for the color version of this figure.

100 = *definitely true*). Finally, participants were debriefed following the procedure described in Greene et al. (2022). The debriefing informed them of the true aims of the study and explained which stories were fabricated. Finally, participants were asked to reconsent to the inclusion of their data in the study. Participation took approximately 20 min.

Results

All data associated with this study may be found online at https://osf.io/jv48c/.

Descriptive Statistics

Irish and German participants differed significantly on a number of variables (see Table 1). German participants were, on average, 4.39 years younger than Irish participants. There was also a significant difference in gender distribution; there were more females among the Irish participants, compared to the German participants. Irish participants were more highly educated than German participants, with 73.2% having earned at least a bachelor's degree, compared with 45.7% of German participants. On average, Irish participants' scores were significantly lower on measures of cognitive ability (RPM-9) and analytic reasoning (CRT). Regarding patriotism, German participants scored significantly lower on both blind and constructive patriotism. Irish participants remembered fewer true stories and more false stories, compared to German participants. There were no significant differences in IWAH scores between the two groups.

True and False Memories

In line with previous research (e.g., Greene et al., 2021; Murphy et al., 2019), we preregistered a definition of memory in which participants were considered to have remembered the event if they selected the option "I remember seeing/hearing about this" (hereinafter, specific memory) or "I don't remember seeing/hearing about this, but I remember it happened" (hereinafter, nonspecific memory). Participants who indicated that they believed (but did not remember) the event or that they remembered the event differently were not deemed to have formed a memory for the target event. On average, participants reported a memory for 48.45% (SD = 20.48%) of true stories and 14.02% (SD = 4.08%) of fabricated stories (see Table 2 for statistics for each story). About a quarter of participants (21.6%) reported remembering at least one of the two fabricated events, while 38 participants (3.2%) remembered both fabricated stories. As shown in Table 1, there was a significant difference in the number of false memories reported by German and Irish participants, with German participants being less likely to report a false memory.

When asked how they had felt upon hearing about the fabricated event, most participants who reported a memory also provided detailed qualitative responses. Evaluation of these responses supports the idea that many participants formed rich, often emotional memories of the false event. Some examples are listed below[1]:

> "While I was delighted for people in the hospitality sectors whose jobs were at risk—I questioned and was disappointed

by MEPs approach to health sector." (27-year-old Irish female, positive Irish story)

> "Angry at the delay in regulation." (36-year-old Irish female, negative Irish story)

> "I smiled a bit because so-called hospitality exists where there is money to be made." (62-year-old German female, positive Irish story)

> "I was amused because this was very typical for Germany, but at the same time deeply disappointed because lives were at stake." (26-year-old German female, negative German story)

> "I was infuriated at the lack of action and unnecessary deaths." (30-year-old Irish female, negative German story)

> "I was appalled that something like this could happen." (32-year-old German male, negative German story)

> "I was in disbelief that the German government could be so hesitant to accept science." (32-year-old Irish male, negative German story)

> "Felt that it was an overreaction. Felt a bit angry at this news, was at [my] wits end with COVID." (29-year-old Irish male, positive German story)

> "Powerless, confirmed in my opinion." (27-year-old German female, negative German story)

Effects of Participant Nationality, Story Nationality, and Story Valence on False Memories

We hypothesized that participants would be more likely to form false memories for fake news stories that reflected positive stereotypes of their own nationality or negative stereotypes of another nationality. To test these hypotheses, a binary logistic model was specified using general estimating equations, where the outcome variable was the presence or absence of a false memory. Generalized estimating equations implement a modeling technique derived from the generalized linear model and allow for parameter estimation with repeated or longitudinal data (Agresti, 2002; Zeger et al., 1988). This approach allowed us to account for both between- and within-subjects variables in the specification of the logistic model. The data met the assumptions of this model, including the independence of observations. An independent structure was specified for the working correlation matrix, and a robust matrix estimator was applied.

Our preregistration called for an initial analysis with within-subjects variable of story nationality (story about Irish people/story about German people) and between-subjects variables of participant nationality (Irish/German) and story valence (positive/negative), and a secondary analysis that included scores on the CRT, RPM-9, IWAH, and blind and constructive patriotism measures as covariates. In the event, the effects of participant nationality, story nationality, and story valence were very similar in both models. In the interests of brevity, we, therefore, present the effects and parameter estimates from the full model, including the covariates, in Table 3. The preregistered analysis excluding covariates may be

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[1] Responses in German have been translated into English for publication purposes. Original responses may be found in online data.

Table 1

Comparison of Demographic and Cognitive Variables Between Irish and German Participants

Variable	German M (SD)	Irish M (SD)	Comparison
Age	30.44 (10.99)	34.83 (10.77)	$t(1,182) = 6.94$, $p \leq .001$, $d = .40$
Gender			
Male	$N = 243$ (40.0%)	$N = 146$ (25.3%)	$\chi^2(3) = 29.46$, $N = 1,184$, $p < .001$, $V = 0.16$
Female	$N = 354$ (58.3%)	$N = 421$ (73.0%)	
Other/prefer to self-identify	$N = 10$ (1.7%)	$N = 10$ (1.7%)	
Education			
Master's degree or higher	$N = 129$ (21.30%)	$N = 166$ (28.80%)	$\chi^2(4) = 98.84$, $N = 1,184$, $p < .001$, $V = 0.29$
Bachelor's degree	$N = 148$ (24.40%)	$N = 256$ (44.40%)	
School leaving certificate	$N = 274$ (45.10%)	$N = 118$ (20.50%)	
Other	$N = 49$ (8.10%)	$N = 33$ (5.70%)	
Prefer not to say	$N = 7$ (1.20%)	$N = 4$ (0.70%)	
CRT score	3.85 (1.56)	3.08 (1.72)	$t(1,182) = 8.00$, $p < .001$, $d = -.47$
RPM score	5.38 (1.76)	4.88 (2.06)	$t(1,182) = -4.55$, $p < .001$, $d = -.27$
Blind patriotism	16.18 (5.37)	17.88 (5.76)	$t(1,182) = 5.25$, $p \leq .001$, $d = .30$
Constructive patriotism	22.79 (3.80)	25.06 (3.31)	$t(1,182) = 10.91$, $p \leq .001$, $d = .63$
IWAH score	26.57 (5.40)	26.75 (5.40)	$t(1,182) = 0.55$, $p = .57$, $d = .03$
True stories remembered	2.12 (.92)	1.75 (.91)	$t(1,182) = -6.82$, $p \leq .001$, $d = -.40$
False stories remembered	.17 (.41)	0.39 (.59)	$t(1,182) = 7.40$, $p < .001$, $d = .43$

Note. CRT = Cognitive Reflection Test; RPM = Raven's Progressive Matrices; IWAH = Identification With All Humanity.

found in Supplemental Materials, along with descriptive statistics and zero-order correlations among the individual difference measures. As age, gender, and education were found to differ significantly between Irish and German participants, an additional analysis was conducted to control for these variables. The results were very similar to those listed in Table 3 and can be found in Supplemental Materials.

Results revealed a significant main effect of participant nationality, such that German participants reported fewer false memories ($M = 0.09$, $SE = 0.1$) than Irish participants ($M = 0.15$, $SE = .01$), and a significant main effect of story nationality, such that more false memories were reported for Irish stories ($M = 0.15$, $SE = 0.01$) than German stories ($M = 0.09$, $SE = 0.01$). There was no main effect of story valence. Two-way interactions were observed between participant nationality and story nationality, participant nationality and story valence, and story valence and story nationality. The predicted three-way interaction did not reach statistical significance ($p = .06$).[2]

In order to clarify the relationships among the predictor variables, exploratory follow-up analyses were conducted separately for Irish and German participants. As shown in Figure 3, the expected interaction was observed for German participants—who were more likely to remember the positive German story and the negative Irish story, $B = -1.18$, Exp $(B) = 0.31$, $p = .004$, but not for the Irish participants, $B = -0.23$, Exp $(B) = 0.80$, $p = .46$, who were generally more likely to remember stories about Ireland, $B = 1.44$, Exp $(B) = 4.23$, $p < .001$, or positive stories about either nationality, $B = 0.60$, Exp $(B) = 1.82$, $p = .01$.

Individual Differences

A significant effect of CRT score was observed, such that participants with higher scores on analytic reasoning reported fewer false memories. A similar effect was found for RPM-9 scores, whereby participants who had higher cognitive ability were also less likely to remember a false story. There was no significant effect of IWAH or blind patriotism on

false memory count. There was a borderline significant effect ($p = .055$) of constructive patriotism, such that participants with higher scores were slightly more susceptible to forming a false memory.

In line with our preregistration, we also investigated whether individual differences in these measures moderated the effect of the independent variables. To do this, we conducted separate logistic regressions for each measure, in which the interaction between the new measure and each of the existing model terms was included. Full details of these analyses may be found in Supplemental Materials. In brief, moderating effects of CRT, RPM-9, and constructive patriotism were observed. As CRT (analytical reasoning) score increased, there was a greater probability of false memories for positive stories among Irish participants, regardless of the nationality featured in the story ($B = 0.27$, $OR = 1.31$, $p = .02$). Higher RPM-9 (fluid intelligence) scores were associated with an increased probability of false memory for the positive Irish story, regardless of participant nationality ($B = 0.38$, $OR = 1.46$, $p = .05$). Finally, higher levels of constructive patriotism were associated with more false memories for German stories, regardless of participant nationality or story valence ($B = -0.17$, $OR = 0.85$, $p = .02$). There were no moderating effects of IWAH or blind patriotism.

Truthfulness Ratings for Fake Stories

The results of a preregistered linear mixed-effects analysis of truthfulness ratings for fake stories are listed in Table 4 and depicted in Figure 4. The assumptions of this analysis, including linearity and independence of observations, were met. The main effects of participant nationality and story nationality were observed, such that Irish participants rated the fake stories as more truthful than German participants, and fake stories about Ireland were rated as more

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[2] A typographical error in the preregistration gave the α level for these analyses as 0.5 instead of the correct level of 0.05.

Table 2

Responses to True and Fabricated Stories: Number and Percentage of Participants Who Endorsed Each Response Option

Response	Fabricated stories			
	Irish positive	German positive	Irish negative	German negative
I remember seeing/hearing this	78 (13%)	46 (7.6%)	73 (12.5%)	21 (3.6%)
I don't remember seeing/hearing this, but I remember it happened	32 (5.3%)	28 (4.7%)	31 (5.3%)	23 (4.0%)
I don't remember this, but I believe it happened	96 (15.9%)	87 (14.5%)	114 (19.6%)	102 (8.6%)
I remember this differently	32 (5.3%)	115 (19.1%)	69 (11.9%)	26 (17.5%)
I don't remember this	364 (60.5%)	326 (54.2%)	295 (50.7)	410 (70.4%)
Total N	602	602	582	582

Response	True stories			
	Champagne party	Green energy	Taliban crisis	Refugees
I remember seeing/hearing this	280 (23.6%)	330 (27.9%)	419 (35.4%)	989 (83.5%)
I don't remember seeing/hearing this, but I remember it happened	46 (3.9%)	81 (6.8%)	81 (6.8%)	70 (5.9%)
I don't remember this, but I believe it happened	173 (14.6%)	218 (18.4%)	213 (18.0%)	69 (5.8%)
I remember this differently	92 (7.8%)	51 (4.3%)	69 (5.8%)	41 (3.5%)
I don't remember this	593 (50.1%)	504 (42.6%)	402 (34%)	15 (1.3%)
Total N	1,184	1,184	1,184	1,184

truthful than fake stories about Germany. There was no main effect of story valence.

Participant nationality interacted separately with both story nationality and story valence, though there was no three-way interaction. Although all participants rated Irish stories as more truthful than German stories, the effect was more pronounced for German participants, who were less likely to believe that the German stories were true. Interestingly, a disordinal interaction between participant nationality and story valence was observed: Irish participants tended to rate positive stories as more truthful than negative stories, while the opposite pattern was observed for German participants.

None of the individual difference measures significantly predicted truthfulness ratings for the fake news stories.

Exploratory Analysis: True Memory and Discrimination

Additional exploratory analyses were conducted to examine the effects of participant nationality and the individual difference measures on participants' memory for true news stories, tendency to report a memory for any given story (response bias), and ability to discriminate between true and false news (d'). These analyses do not include the variables of story nationality and story valence, which were not manipulated for true stories.

Table 3

Results of a Mixed Logistic Regression Analysis Predicting False Memories as a Function of Participant Nationality, Story Nationality, and Story Valence, With the Covariates of CRT Score, RPM Score, IWAH Score, and Blind and Constructive Patriotism Score

Predictor	Test of effects (Type III)			Parameter estimates			
	Wald χ^2	df	p	B	SE (b)	Exp (b)	95% CI for Exp (b)
Intercept	13.61	1	<.001	−2.69	0.63	0.07	[0.02, 0.23]
Factors							
Participant nationality	16.05	1	**<.001**	−0.27	0.32	0.76	[0.41, 1.42]
Story nationality	16.75	1	**<.001**	0.31	0.30	1.36	[0.75, 2.441]
Story valence	1.76	1	.18	0.48	0.28	1.62	[0.93, 2.82]
Participant Nationality × Story Nationality	40.05	1	**<.001**	1.16	0.38	3.18	[1.50, 6.74]
Participant Nationality × Story Valence	4.49	1	**.03**	0.13	0.40	1.14	[0.52, 2.50]
Story Nationality × Story Valence	7.51	1	**.006**	−1.19	0.41	0.31	[0.14, 0.68]
Participant Nationality × Story Nationality × Story Valence	3.436	1	.06	0.96	0.52	2.61	[0.95, 7.20]
Covariates							
CRT score	5.82	1	**.02**	−0.10	0.04	0.90	[0.83, 0.98]
RPM score	5.48	1	**.02**	−0.09	0.04	0.92	[0.85, 0.99]
IWAH score	0.03	1	.86	0.00	0.01	1.00	[0.97, 1.02]
Blind patriotism score	1.27	1	.26	0.04	0.02	1.04	[0.99, 1.08]
Constructive patriotism score	3.67	1	.055	0.01	0.01	1.01	[0.99, 1.04]

Note. Categorical variable coding: Participant nationality: Irish = 0, German = 1. Story nationality: Irish = 0, German = 1. Story valence: 0 = positive, 1 = negative. CRT = Cognitive Reflection Test; RPM = Raven's Progressive Matrices; IWAH = Identification With All Humanity; SE = standard error; CI = confidence interval. Statistically significant predictors ($p < .05$) are highlighted in bold.

Figure 3

Mean Number of False Memories Reported, as a Function of Participant Nationality, Story Nationality, and Story Valence
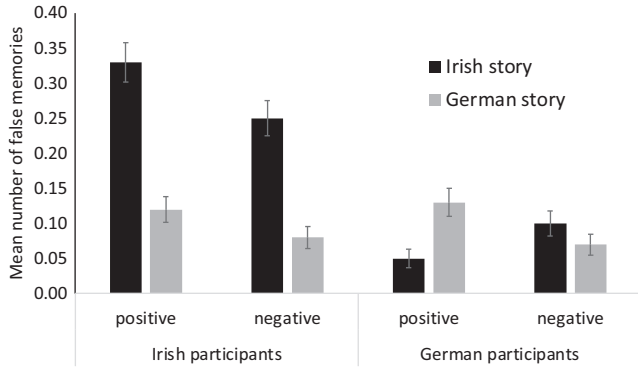
Full details of these analyses may be seen in Supplemental Materials. In brief, German participants reported more true memories than Irish participants. Analysis of signal detection measures indicated that German participants were better able to discriminate true from false stories and had a higher threshold for identifying a story as true. A significant effect of constructive patriotism on true memory count was observed, such that more patriotic participants reported more memories for true stories. Further analysis indicated that this was driven by a shift in response bias rather than discrimination ability. Finally, CRT score significantly affected d' values, such that more analytical participants were better able to discriminate true from false stories.

Discussion

The goal of this study was to investigate whether stereotypes relating to people's nationality would influence the formation of false memories for fake news. In keeping with both social identity theory and the source-monitoring framework, we expected that participants would tend to form false memories for items stories that may help them to maintain a distinct and positive national identity—that is, stories that reflected positive stereotypes of the in-group (the participants' own nationality) and negative stereotypes of the out-group (another nationality).

To test this hypothesis, each participant viewed two fictitious stories, one about Irish people and one about German people. Both stories reflected either positive or negative stereotypes of the nationality in question. Overall, 21.6% of participants reported a memory for at least one of the two fabricated events, and qualitative responses suggest that some participants had formed rich, emotional false memories for the fabricated stories. Our primary preregistered hypotheses predicted the same pattern of results for both participant groups, but this was not observed. Instead, the predicted pattern of results was observed only in an exploratory analysis of the German sample: German participants were more likely to report a false memory for the positively valenced story about Germany and the negatively valenced story about Ireland. This aligns with previous evidence regarding the tendency to selectively notice and recall positive information regarding the in-group, while derogating the out-group (Kahan, 2017; Van Bavel & Pereira, 2018), and with past research demonstrating increased false memory rates for ideologically congruent fake news stories (e.g., Frenda et al., 2013; Greene et al., 2021; Murphy et al., 2019). The predicted interaction was not observed for Irish participants, who were more likely to report a false memory for stories about Ireland, regardless of valence, and positive stories, regardless of the nationality mentioned. Although the follow-up analyses of each nationality produced different patterns of results, it is important to note that the three-way interaction did not reach statistical significance ($p = .06$), suggesting that the intergroup differences may not be reliable. Further research will be required to replicate this result.

Table 4

Results of a Mixed Linear Regression Analysis Predicting Truthfulness Ratings for the Fake Stories, as a Function of Participant Nationality, Story Nationality, and Story Valence, With the Covariates of CRT Score, RPM Score, IWAH Score, and Blind and Constructive Patriotism Score

Predictor	Test of effects (Type III)			Parameter estimates			
	Wald χ^2	df	p	B	SE (b)	Exp (b)	95% CI for Exp (b)
Intercept	59.92	1	<.001	33.98	5.50	5.72E + 14	[1.20E + 10, 2.73E + 19]
Factors							
Participant nationality	33.32	1	**<.001**	4.21	2.17	67.35	[0.95, 4764.03]
Story nationality	116.44	1	**<.001**	15.04	1.98	3384928.04	[69458.24, 164958654.85]
Story valence	0.66	1	.42	−4.33	2.14	0.01	[0, 0.88]
Participant Nationality × Story Nationality	4.32	1	**.04**	−3.42	2.93	0.03	[0, 10.22]
Participant Nationality × Story Valence	17.38	1	**<.001**	10.71	3.10	44971.23	[103.23, 19590441.80]
Story Nationality × Story Valence	3.55	1	.06	−3.01	2.73	0.05	[0, 10.29]
Participant Nationality × Story Nationality × Story Valence	0.20	1	.65	−1.90	4.21	0.15	[0.0000394, 569.29]
Covariates							
CRT score	0.18	1	.67	0.18	0.42	1.19	[0.53, 2.69]
RPM score	0.16	1	.69	−0.14	0.35	0.87	[0.43, 1.74]
IWAH score	0.26	1	.61	−0.06	0.11	0.94	[0.75, 1.18]
Blind patriotism score	0.08	1	.78	−0.03	0.11	0.97	[0.78, 1.20]
Constructive patriotism score	0.96	1	.33	0.17	0.17	1.19	[0.843, 1.66]

Note. Categorical variable coding: Participant nationality: Irish = 0, German = 1. Story nationality: Irish = 0, German = 1. Story valence: 0 = positive, 1 = negative. CRT = Cognitive Reflection Test; RPM = Raven's Progressive Matrices; IWAH = Identification With All Humanity; SE = standard error; CI = confidence interval. Statistically significant predictors ($p < .05$) are highlighted in bold.

Figure 4

Truthfulness Ratings for the Fake Stories as a Function of Participant Nationality, Story Nationality, and Story Valence
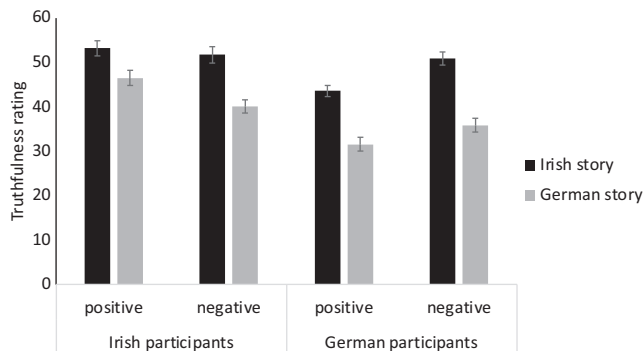
Beyond testing our primary hypothesis, analysis of the effects of individual differences on false memories yielded some interesting results. While the hypothesized three-way interaction was not moderated by any of the proposed variables, higher scores on the CRT and RPM-9 significantly decreased rates of false memories. This is in line with findings of previous research (Murphy et al., 2019; Zhu et al., 2010), which show that higher levels of intelligence or analytic reasoning can protect against forming a false memory for fake news. CRT scores were also significantly associated with discrimination ability; participants higher in analytic reasoning were better able to distinguish between true and false news stories. This finding may explain in part, why Irish participants were less likely to report a memory for a true news story, as they scored significantly lower than their German counterparts on the CRT. Future research could explicitly compare the motivated cognition and analytical reasoning accounts of fake new susceptibility in the context of national stereotypes, in line with previous work (Pennycook & Rand, 2019).

Both CRT and RPM-9 scores also moderated the two-way interaction between participant nationality and story valence, increasing the tendency for Irish participants to report memories for positive stories (and reducing their tendency to report memories for negative stories). There were also some weak effects of constructive patriotism on false memory formation, with more patriotic participants tending to report more false memories, especially for German stories, but interestingly this was not moderated by participant nationality or the story valence. Overall, while individual differences in cognitive ability had a substantial impact on susceptibility to false memories for fake news stories, the effects of variation in national identification were negligible.

Strengths and Limitations

A strength of the present study was the careful identification of target stereotypes, using converging data from multiple open-ended and closed pilot studies. A researcher who wishes to study emotion, for example, may make use of one of the many validated sets of emotionally manipulative materials such as the International Affective Picture System (IAPS; Lang et al., 2008). At present, no such validated database of national stereotypes exists, and moreover, it was essential to this project that the stereotypes in

question be held by the target populations. That is, it was important to know whether German and Irish people specifically held each of the stereotypes used in the study, since their attitudes and beliefs might differ from those held by participants in other countries with a different level of exposure to the target nationality. Importantly, the pilot participants' beliefs regarding the prevalence of particular stereotypes varied by nationality—for example, German participants believed that most people would consider Germans to be party poopers who are overly concerned with punctuality, but those stereotypes were much less prevalent among the Irish sample. These incorrect assumptions may even be held by researchers themselves, who may be led by their own biases to make assumptions about which stereotypes of their own (or another) nationality are most common. We therefore recommend the careful selection of sample-specific stereotypes in any future research into this topic.

The goal of the present study was to identify stereotypes that were commonly held among members of the target populations. It is, however, likely that the strength of these stereotypes will vary between individuals and that this might influence participants' responses to the news stories. Moreover, it is possible that similar results could be achieved with positively and negatively valenced stories that are not aligned with national stereotypes. Future research might include a measure of individual differences in stereotype strength as well assessment of nonstereotypical stories to explore this possibility.

It was not possible to achieve a perfect match in both commonness and valence between the Irish and German stereotypes and nor was this our goal. It is possible that the differences in the selected stereotypes observed during pilot testing might have influenced the responses to the German and Irish stories; however, it is important to note that very substantial differences in valence ratings were observed between the positive and negative stereotypes for both target nationalities. In addition, the positive and negative stereotypes appeared frequently in the open-ended pilot, ensuring that the selected stereotypes were indeed clearly positively or negatively valenced, and commonly held. Thus, while the absolute magnitude of the difference in valence differed slightly between the two target nationalities, the general pattern was very similar, and cannot easily account for the absence of the predicted pattern of results in the Irish sample.

Despite our efforts to ensure similar levels of plausibility across all stories (ensured via pilot testing), the fake stories referring to Ireland were rated as more truthful than those related to Germany by all participants, and the Irish sample was considerably more likely to report a memory for the Irish stories. Although the events described in the news stories never happened, it is possible that these Irish stories had more overlap with real-world events. For example, throughout 2021–2022, Irish media regularly reported on shifting regulations around hospitality and the consequences of pub closures for communities and businesses. The fabricated stories regarding hospitality and pub culture may have been read in this context, leading participants to make a source attribution error. The magnitude of this effect may have overshadowed any potential interaction with story valence—as seen in Figure 3, the interaction effect observed for German participants was relatively small. This contextual issue might also explain an interesting observation in the comparison of the truthfulness and false memory data. Across all conditions, stories about Ireland were rated as more truthful than

stories about Germany. A similar pattern was held for false memories, with more memory reports for Irish stories than German stories, with the exception of the response to positive stories among German participants. In this case, the participants were *less* likely to report a false memory for the Irish story, even though they rated it as more truthful than its German counterpart. Again, it is possible that while the positive Irish story felt plausible to German readers, their lack of experience with the Irish media landscape may have suppressed feelings of familiarity that might trigger a false memory. Notably, the Irish participants did not show this bias, which may be due to them treating both news sources equally. This finding underlines the importance of context when considering response to fake news: Variations in the national media landscape may affect how fabricated or misleading news stories are received and processed.

In addition, the Irish and German samples differed on a number of variables; German participants were younger and less educated than Irish participants but scored higher on measures of intelligence and analytical reasoning. Irish participants were also more patriotic, as measured by both the blind and constructive patriotism scales. These factors might contribute to average differences in response between the two groups, but importantly, the effects described above were all observed after controlling for individual differences. Thus, we argue that the inferences drawn from the present research should not biased by these population differences.

A final consideration relates to the images that accompany each news story. The selected images differed for the German and Irish stories; there is, therefore, a slight possibility that characteristics of the images may have affected performance, but we consider this to be unlikely. There is good evidence that including a nonprobative photograph can influence false memory construction by increasing the fluency of cognitive processing and implying the presence of a second source of information, even if the image itself is devoid of useful content. This is known as the "truthiness effect" and has been well characterized (see Newman & Zhang, 2020, for a review). The "truthiness" effect derives not from the visual details of the photograph itself but from the semantic information it is assumed to contain. Thus, the stock images chosen for inclusion in this study were an image of a pub, to accompany stories about pub culture and tourism in Ireland, and images of a surgical mask and antigen test to accompany stories about measures to reduce COVID-19 spread in Germany. These images were nonprobative—that is, they provided no information about the events described in the story and no clues as to their veracity. In addition, these images were used to accompany both positively and negatively valenced stories. We consider it to be unlikely that visual features of the images could have affected memory construction in the present study as the task was to recall the events described in the news story, not to remember or recognize the accompanying photograph. Moreover, any such effects would apply equally to both the positively and negatively valenced stories about each nationality and would therefore be canceled out in any analysis that included story valence.

Constraints on Generality

The present study focussed on participants from Germany and Ireland for reasons of convenience, owing to the authors' familiarity with those countries and facility with the appropriate languages. The results may not readily generalize beyond these nationalities. In addition, the fake stories employed in the study all related to COVID-19, since that was the dominant topic in news media about specific nationalities at the time of data collection. Future research should explore the role of national identity on fake news susceptibility in relation to different topics (e.g., climate change, immigration, or vaccination) in a range of countries. The results of this study suggest that response to identical news stories is likely to be starkly different in different countries; for example, response to stories about climate change may differ depending on whether the country in question has experienced a recent increase in drastic weather events. The conclusions that can be drawn from these results may therefore be constrained to this topic, and further research is needed to identify the limits of generalizability to other topics.

Conclusion

These results suggest that national identity may influence the formation of false memories of fake news, with memory formation potentially affected by the extent to which news stories reflect positive or negative views of a given country. Variations in cultural context may also affect how misinformation is received and processed, though further investigation is needed as the present study investigated only two countries. Future research should consider the sociopolitical landscape and cultural context carefully before drawing generalized conclusions about response to misinformation.

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