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First language as a determinant of implicit and explicit language attitudes: Catalan/Spanish bilinguals' general language attitudes and response to language choice in a COVID-19 vaccination advertisement

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Abstract: This study aims to contribute new insight into the study of languages in contact by comparing the implicit and explicit general language attitudes of bilingual individuals towards their first and second language in health communication in a multilingual society, through a combination of survey and experimental methods. We investigated to what extent 358 L1 Catalan and 338 L1 Spanish speakers in Catalonia differed in their general attitudes to Catalan and Spanish (explicit language attitudes) and in their reactions to the use of these languages in health advertising, specifically in an advertisement promoting COVID-19 vaccination (implicit language attitudes). This is the first study of its kind in a European multilingual context. Based on accommodation theory and theory related to first-language preference, participants were expected to prefer their L1 and the L1 advertisement. Findings offer support for first-language preference in terms of general language attitudes. However, the language of the ad and participants' first language had little impact on ad-related response. There were no effects of language on attitude towards the ad, attitude towards vaccination and vaccination intention, but the L1 Catalan participants felt the Catalan ad had more appropriate language and expressed more cultural respect than the Spanish ad. Thus, in the current study, explicit language attitudes revealed first-language preference, while implicit language attitudes did so to a limited extent.

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1 Introduction

Language contact can be studied from different perspectives (for overviews, see Winford 2020; Winter-Froemel et al., this issue). One perspective is to investigate how words from one language are used and integrated into another language (see, for example, Gärtig-Bressan, this issue; Meinschaefer, this issue; Schirakowski, this issue; Winter-Froemel, this issue). Another important aspect of language contact is how language users evaluate and respond to languages they are exposed to. As Haugen (1956: 95) puts it, "[w]herever languages are in contact, one is likely to find certain prevalent attitudes of favor or disfavor towards the languages involved." Overall, research has shown a tendency for people to have more positive attitudes towards their first language than to other languages (Ferguson 1968; Kinzler et al. 2007). This first-language preference can be seen in people's general language attitudes (Hilton and Gooskens 2013) and in their response to specific messages, for instance advertisements, in their first language versus other languages (Cui 1997; Koslow et al. 1994). Accommodation theory claims that when, in communication, the sender of a message adapts the language of the message to the language of the receiver (partly or fully), the receiver sees this accommodation as a recognition of the value of their language and identity, which in turn will result in a more positive response from the receiver to the message than when the language is not adapted to the receiver's language (Giles et al. 1973, 1991). This implies that generally a message which is partly or fully in a bilingual's first language (L1) would lead to a more positive attitude from the receiver towards the message than towards the same message in a bilingual's second language (L2). However, there are indications that, in some linguistic contexts, people may respond more negatively to their own language variety than to a different language variety, which has a higher social status. For instance, Adams (2019) shows that participants from Tayside in Scotland considered trivia statements uttered in their own Dundee accent to be less persuasive than statements in Estuary English.

The measurement of general language attitudes can be seen as direct or explicit attitude measures since participants are asked to evaluate specific languages, mentioned by name (cf. Hassall et al. 2008; Kristiansen 2010; McKenzie 2015: 38; McKenzie and Carrie 2018). The measurement of the effects of the language used in a message can be considered an indirect or implicit measurement of language attitudes when participants are asked to evaluate the message and its sender, without

the language of the message being mentioned (cf. Hassall et al. 2008; Kristiansen 2010; McKenzie 2015). Research indicates that the attitudes revealed by the two types of measurement may diverge, showing different valence of participants' evaluation of the languages (Hassall et al. 2008; Kristiansen 2010; Lambert et al. 1965). It has been suggested that indirect measurements elicit responses that are more unconscious, and that unconscious responses would be more private and genuine. Consequently, these responses elicited through indirect measurements would be a more accurate reflection of participants' language attitudes (Kristiansen 2010; Lambert et al. 1965) since they are less or not at all influenced by what is socially desirable (cf. Lambert et al. 1965: 90; Kristiansen 2010: 60–61). This contrasts with direct measurements that may elicit responses that could be more affected by common ideas such as, for instance, prejudices or ideologies about language variation and languages other than the individual's own language. Thus, each type of measurement may yield insight into different aspects of people's language attitudes.

There are very few studies on the effects of first-language preference in health advertising, a societally relevant type of message to study since it is important to determine if the use of the target group's first language may contribute to convincing them to engage in healthy behaviour. The three studies that have been conducted to-date (Kelly et al. 2006, 2010; Razzouk et al. 2021) are limited with respect to the geographical location, the languages and bilingual ethnic groups studied, participant characteristics (age, social group and level of education), and the content of the health messages. All three studies were conducted in the USA, testing the effects of Spanish and English on bilingual Hispanics, more particularly young students, specifically in anti-tobacco campaigns. The status of the two languages is specific in terms of legal status and the proportion of speakers. In the USA, neither English nor Spanish has official legal status at the federal level (U.S. Constitution n.d.), although English is the official language in a number of states (Nieto 2021). Spanish is a minority language, but Hispanics are a large minority, numbering 62.080.044, representing 18.73 % of the US population (USA Census 2020). These limitations and the specific characteristics of the bilingual situation that was studied constrain the generalizability of the findings of the three studies to other bilingual groups. In addition, the studies only measured ad-related attitudes (implicit language attitude measurements) and not participants' general language attitudes (explicit language attitude measurements), which limits these studies concerning the insights they provide into first-language preference and attitudes towards L1 versus L2.

The aim of the current study was to improve our understanding of the effects of language choice in health communication for bilinguals by studying general attitudes to first and second languages and attitudes to the use of these languages in

health communication in a multilingual context different from that of the USA. An example of such a multilingual context is the autonomous region of Catalonia in Spain, where Catalan and Spanish are in contact. In Catalonia, Catalan is the autochthonous language, and Spanish could be called a heritage language, being the language of immigrants to Catalonia but understood and used by a majority of inhabitants of Catalonia. According to the Catalan *Estatut de Autonomia* (Parlament de Catalunya 2016, article 6.1: 23), Catalan is considered the *llengua pròpia de Catalunya* ['the language proper of Catalonia'], the usual and preferred language of public administration and institutional communication media, and the language normally used in education. Article 6.2 states that Catalan is the official language of Catalonia, and that Spanish is also an official language since Spanish is the official language of the Spanish state. According to the most recent available data offered by *Institut d'Estadística de Catalunya* ([Idescat] 2023), in 2018, a large majority of the Catalan population, aged 15 years and above, reported that they understand and speak both languages (understanding: Catalan 94.4 %; Spanish 99.8 %; speaking: Catalan 81.2 %; Spanish 99.5 %). In 2018, Catalan was the first language (*llengua inicial*) for 31.5 %, Spanish for 52.7 %, and both languages for 2.8 % of the inhabitants. Even though both Catalan and Spanish are actively present in Catalan society, it can be concluded that Spanish is the majority language compared to Catalan.

In order to study the effects of the use of Catalan or Spanish in health advertising for L1 Catalan and L1 Spanish speakers, we chose COVID-19 vaccination as a theme for a health communication advertisement in Catalonia. At the time of our investigation in 2021, persuading people to be vaccinated against COVID-19 was a relevant issue in Catalonia (El País 2021) as it was elsewhere in the world. There has been much research into language attitudes in Catalonia (for a recent overview, see Pradilla Cardona 2022). However, there appears to be no study that combines an explicit method of investigating general first-language preference with an implicit method of investigating first-language preference in health advertising. Our research question therefore is:

RQ: To what extent does the first language of Catalan/Spanish bilinguals influence their explicit language attitudes to Catalan and Spanish (general language attitudes) and their implicit language attitudes to Catalan and Spanish as measured through their response to language choice in a COVID-19 vaccination advertisement?

To increase the generalisability of our answer to this research question, we aimed to study a range of participants that was broader than the young-student samples used in earlier studies (surveys of general language attitudes in Catalonia: Ianos et al. [2020]; Madariaga et al. [2016]; experiments on the effects of language choice in health advertising on bilinguals: Kelly et al. [2006], [2010]; Razzouk et al. [2021]).

1.1 General language preference

Research has shown that children from a very early age on show a preference for people who speak their own native language: they look at native speakers longer than at foreign-language speakers, reach more for toys offered by a native speaker than a foreign speaker, and would rather have a child who spoke their own language as a friend than one speaking a foreign language (Kinzler et al. [2007]; for an overview of similar studies, see Dragojevic et al. [2021: 66]). Ferguson (1968: 251) describes the general tendency that speakers prefer their own L1 to their L2 or foreign languages as follows: "[t]he notion that one's own language is superior to other languages is quite widespread and may be regarded as a 'normal' component of the language myths of any speech community". For example, studies in the Netherlands showed that L1 Frisian speakers expressed a preference for Frisian over Dutch, while L1 Dutch speakers expressed a preference for Dutch over Frisian (Hilton and Gooskens 2013; Ytsma 2007).

A number of surveys conducted in Catalonia also revealed that respondents show a preference for their L1. Huguet and Janés (2008) found that young Hispanic immigrants at secondary schools in Catalonia with L1 Spanish had more favourable attitudes towards Spanish than towards Catalan. In a survey among secondary-school students, those who had Catalan as their family language expressed more favourable attitudes towards Catalan, and those who had Spanish as their family language expressed more favourable attitudes towards Spanish (Madariaga et al. 2016). Similarly, results from an implicit association test conducted by Ianos et al. (2020) showed that secondary-school pupils whose home language was Catalan had more positive associations with Catalan than with Spanish, and the reverse was true for pupils whose home language was Spanish. More favourable attitudes towards L1 were also found for university students in Van Hooft et al. (2019): L1 Catalan participants had a more positive general language attitude towards Catalan than L1 Spanish participants, and L1 Spanish participants had a more positive attitude towards Spanish than L1 Catalan participants. Within the L1 Catalan participant group, the attitude towards Catalan was more favourable than the attitude towards Spanish. However, within the L1 Spanish group, the attitude towards Catalan and Spanish was similar. The latter finding indicates that first-language preference is not always found. This was also the case in Kubat and Swaminathan (2015, study 1, 2 and 3), where bilingual consumers in the USA with L1 Hindi, Chinese, or Spanish and L2 English showed no differences in general liking for Hindi/Chinese/Spanish and English. Nevertheless, there is more evidence for more positive attitudes towards L1 than towards L2. We therefore formulate the following hypothesis:

H1: Bilingual Catalan/Spanish inhabitants of Catalonia have more positive general language attitudes towards their L1 than towards their L2

Language has been seen as a marker of ethnic or group identity (Edwards 2016; Grosjean 1982: 117; Joseph 2004, 2016; Lawson and Sachdev 2004: 56). Edwards (2016: 493), for instance, remarks "[a]ll languages also have very powerful symbolic significance as bearers of culture, as vehicles of group myth and narrative, and as markers of ethnic or nationalist belonging – in short, as carriers and indicators of identity". In a quantitative study among Catalan/Spanish bilinguals using survey questions, Van Hooft et al. (2019) found that speakers' identification with L1 was stronger. L1 Catalan participants identified more with the Catalan language than the L1 Spanish participants, and L1 Spanish participants identified more with Spanish than L1 Catalan participants. Within the L1 Catalan participant group, identification with Catalan was greater than identification with Spanish, and the L1 Spanish group identified more with Spanish than with Catalan. On the other hand, some studies have argued that the relationship between language and identity in Catalonia is not always so strong since qualitative interview and focus-group studies indicate that some inhabitants of Catalonia, including young Catalans, do not see language as an expression of their identity (Frekko 2013; Pujolar and González 2013; Woolard and Frekko 2013). A qualitative study by Pujolar and González (2013), combining interviews and discussions with young Catalans, for instance, showed that most of the participants did not use Catalan or Spanish as an expression of group identity. However, the general observations about language as a marker of ethnic identity and the quantitative evidence found in Van Hooft et al. (2019) lead us to the following hypothesis:

H2: Bilingual Catalan/Spanish inhabitants of Catalonia identify more with their L1 than with their L2

Fishman (1989: 471) posits that "[a] language not only indexes and symbolizes its associated culture, but it is part and parcel of that culture". This is underlined by the finding in Ross et al. (2002) that the use of Chinese in a questionnaire primed Chinese traditional values and self-views in Chinese/English bilinguals, while the use of English primed Western values and self-perceptions. In line with this, Panicacci (2019) demonstrated that for Italian migrants in several English-speaking countries, their sense of belonging to their original and host culture could to a large extent be explained by their use of Italian (their L1) and English (their L2) and how they perceived the emotionality of the two languages. In view of the general link between language and culture, and since L1 speakers are likely to use their L1 more than their L2 and have been shown to find their L1 more emotional than their L2 (e.g., Dewaele 2010), we formulate the following hypothesis:

H3: Bilingual Catalan/Spanish inhabitants of Catalonia feel a greater sense of belonging to the culture of their L1 than the culture of their L2.

1.2 Bilingual speakers' attitudes to language choice in product and health advertising: implicit language attitudes

1.2.1 Language accommodation in product advertising

According to Cui (1997: 131), "[l]anguage is the vehicle of communication for accessing ethnic consumers. Messages created in ethnic languages help relating products to the needs of ethnic consumers and improving advertising effectiveness". The importance of accommodating to a group's first language as opposed to a country's majority language has been researched in persuasive communication in the form of product advertisements in multilingual societies in the USA and Europe (for an overview, see Hornikx and Van Meurs 2020: 38–39, 123–153). This was investigated in the USA for bilingual minority groups that speak English and their heritage language – Hindi Chinese or Spanish (Kubat and Swaminathan 2015), Korean (Dublish 2001) and Spanish (Koslow et al. 1994) – and in Spain for Basque/Spanish bilinguals (Monge-Benito et al. 2019) and Catalan/Spanish bilinguals (Van Hooft et al. 2019).

The results of the US studies on the effects of first- or second-language use in product advertising for bilinguals provide mixed evidence for a favourable effect of language accommodation on ad-related evaluations (implicit language attitudes). Dublish (2001) showed no differences in evaluation of Korean versus English advertisements by bilingual Korean American consumers in terms of attitude towards the ad, attitude towards the brand, purchase intention and brand identification. This was the case for Korean participants with both a low and a high degree of acculturation into Anglo American society. However, Koslow et al. (1994) found support for a favourable effect of language accommodation: Hispanic consumers in the USA regarded an advertiser as more culturally sensitive when advertisements included Spanish words or were fully in Spanish than when the same advertisements were fully in English, which, in turn, led to a more positive affect towards the advertisement. On the other hand, affect towards the advertisement was, overall, lower for the all-Spanish advertisements than for the all-English, English-dominant, and Spanish-dominant ones. Kubat and Swaminathan (2015, study 1, 2 and 3) found that bilingual consumers with L1 Hindi, Chinese, or Spanish and L2 English showed higher brand liking for an ad using Hindi/Chinese/Spanish in combination with English than for an English-only ad for products that were low in American cultural symbolism (the jeans brand GAP and the beer brand Coors) but not for brands that were high in American cultural symbolism (the jeans brand Levi's and the beer brand Budweiser). In summary, the various US studies provide some evidence for a more favourable response to language accommodation at the level of responses to advertisements, but this is not always found.

Studies in two bilingual societies in Spain, the autonomous regions of the Basque Country and Catalonia, revealed no effects of the use of the participants' first or second language in advertising, that is, implicit language attitudes (Monge-Benito et al. 2019; Van Hooft et al. 2019). Monge-Benito et al. (2019) showed that there were no differences between bilingual Basque-Spanish participants who watched Basque and Spanish versions of TV commercials, neither in terms of questionnaire items measuring ad response (recall, ad liking, purchase intention and intention to recommend the product), nor in terms of psychophysiological reactions measuring emotional response (skin conductivity and heart-rate variability). In an experiment with L1 Catalan and L1 Spanish participants, Van Hooft et al. (2019) found no effect of language of the advertisements (Catalan vs. Spanish) on consumer response (a combination of attitude towards the ad, attitude towards the company, attitude towards the product, and purchase intention).

1.2.2 Language accommodation in health advertising

A small number of studies have researched the impact of language accommodation in health advertising, specifically in anti-tobacco advertisements for Hispanics in the USA (Kelly et al. 2006, 2010; Razzouk et al. 2021). Kelly et al. (2006) investigated how bilingual Mexican-American youngsters responded to the use of English, Spanish, or a combination of English and Spanish in advertisements against the use of tobacco. Although the participants indicated that they identified more with Mexican-American culture than Anglo-American culture and reported that they spoke Spanish in a number of contexts, they evaluated the English ads as more readable and more effective. Kelly et al. (2010) found no differences in the responses of bilingual Mexican-American youngsters to anti-tobacco ads in English, Spanish, and 'Spanglish' (in the latter, Spanish and English words were combined in the same sentences) in terms of ad appeal, believability, and perceived deterrence. However, the higher the participants' acculturation in Anglo-American culture was (measured as the extent to which they used English in different social contexts), the less readable they considered the all-Spanish ads to be, indicating that more use of English makes Spanish more difficult to understand. Razzouk et al. (2021) asked Hispanic participants to evaluate ads for e-cigarettes with a warning in English ('WARNING: This product contains nicotine. Nicotine is an addictive chemical'), in Spanish ('*ADVERTENCIA: Este producto contiene nicotina. La nicotina es un químico adictivo.*') or in both languages. Spanish-dominant Hispanic participants (participants who indicated that they were bilingual but preferred Spanish or were proficient only in Spanish) evaluated the dual language warning as more "overblown, manipulative, and annoying" (Razzouk et al. 2021) than an English-only warning, and an ad with a Spanish-only warning was evaluated as clearer and more appealing and led to a

higher likelihood of purchase than an ad with an English-only warning. It may be concluded that while the latter findings do show a better effect for L1, they are not in line with the intended effects of the health warning. The negative evaluation of the ad with the dual language warning indicates that using both the L1 and L2 of the readers in health messages may not be the best persuasion strategy.

Thus, overall, the three studies showed mixed findings for the effects of Spanish as L1 versus English as L2 in health advertising for Hispanics since Kelly et al. (2006) found better evaluations of English (L2) and Kelly et al. (2010) found no differences in evaluation of English as L2 and Spanish as L1 (with one exception: an ad in Spanish was seen as less readable if participants were more acculturated into Anglo-American culture). The lack of consistency between the results of the two studies, which is not explained, underlines the relevance of further research into the role of L1 versus L2 in health communication for bilingual individuals.

In conclusion, findings of earlier studies regarding the effects of L1 versus L2 on persuasiveness in product advertising and health advertising were mixed. Some studies showed more positive effects of L1 than of L2, others showed a more positive effect of L2 than of L1, while others showed no effects. However, in most studies no differences in effects were found of L1 versus L2 on persuasiveness. An underlying reason for expecting no differences in the latter effects may be outweighed by other considerations. In the current study, the persuasiveness of a COVID-19 vaccination advertisement is likely to be influenced less by the use of L1 or L2 than by the perceived health risk of the COVID-19 virus at individual and societal level and the urgency of the required change in behaviour (cf. Ajzen and Fishbein 1977). As is customary in advertising research (Geuens and De Pelsmacker 2017: 7), we measure persuasiveness in terms of attitude towards the ad, attitude towards the intended behaviour (vaccination) and behavioural intention (vaccination intention). Therefore, we formulate the following hypotheses:

H4: There will be no differences in the effects of Catalan versus Spanish in COVID-19 advertisements on Catalan/Spanish bilinguals (with L1 Catalan and L1 Spanish), in terms of attitude towards the ad (H4a), attitude towards vaccination (H4b), and vaccination intention (H4c).

However, we do expect effects of language accommodation on two other dimensions: perceived cultural sensitivity and appropriateness of the language used. Koslow et al. (1994) demonstrated that Hispanic consumers in the USA regarded an advertiser as more culturally sensitive when advertisements included Spanish words or were fully in Spanish than when the same advertisements were fully in English. Most of the participants in Koslow et al.'s (1994) study were bilingual Hispanics, with Spanish as L1, which suggests that bilinguals regard advertising in their L1 as more culturally

sensitive than advertising in their L2. The appropriateness of language choice in particular situations is an important notion in sociolinguistics (e.g., Fishman et al. 1968: 1175, 1177–1178; Spolsky 2004: 9). Van Vaerenberg and Holmqvist (2013) asked bilingual Belgian customers (L1 Dutch and L2 French) to indicate the appropriateness of the language used by a waiter (Dutch, French and Dutch with a French accent), as one of the items measuring perceived 'language accommodation', in relation to tipping behaviour. They found that consumers were less willing to tip when the waiter spoke their L2 (French), and that perceived language accommodation completely mediated willingness to tip. We, therefore, formulate the following two hypotheses:

H5: The use of the readers' L1 in COVID-19 advertisements will lead to greater perceived cultural respect expressed in the advertisement than the use of the readers' L2.

H6: The use of the readers' L1 in COVID-19 advertisements will be considered to be more appropriate than the use of the readers' L2.

We tested the six hypotheses in an empirical study which combined a survey and an experiment, to investigate Catalan/Spanish bilinguals' (a) explicit general language attitudes and (b) implicit language attitudes in terms of response to a health advertisement in Catalan or Spanish.

2 Methodology

2.1 Design

This study had four parts: (1) screening questions; (2) an experiment to measure participants' response to attitudes towards a COVID-19 vaccination advertisement (to collect implicit language attitudes); (3) a survey to measure participants' general attitudes by means of explicit questions; and (4) questions about participants' demographic characteristics. After the screening questions, we first implemented an experiment with a 2×2 between-subject *post-hoc* only design, in order to establish how the language version of the advertisement (Catalan/Spanish) and participants' self-reported first language (L1) (Catalan/Spanish) influence dependent variables that function as measures of implicit language attitudes. Subsequently, in the survey section of this study, participants were asked to express their general language attitudes towards Catalan and Spanish either as L1 or as L2, Catalan and Spanish culture and language identification by means of a series of questions in which explicit reference was made either to Catalan and Spanish.

We chose to use a between-subject design for the experiment in order to make sure that the participants could not compare the two language versions of the ad. This was done to prevent participants from being aware that their language attitudes were being measured. To further prevent the participants from being aware that the experiment measured their language attitudes, we included the explicit measures of general language attitudes *after* the experimental part of the questionnaire. This meant that the participants saw either a Catalan- or Spanish-language version of the COVID-19 vaccination advertisement in the experiment before explicitly indicating their general language attitudes toward Catalan and Spanish. In order to check if the language of the advertisement they had seen influenced participants' subsequent expression of general language attitudes, we conducted statistical tests that measured if and how participants' general language attitudes were influenced not only by their first language but also by the language of the advertisement they had seen.

2.2 Procedure

The data were collected in three rounds. First, participants were approached at universities in Catalonia (Universitat Autònoma de Barcelona, Universitat de Barcelona, Universitat de Lleida, Universitat Pompeu Fabra, Universitat Ramon Llull) and through the networks of the secondary school Institut Joan Oró in Lleida, between 3 and 25 May 2021, using the snowball sampling method. In the second and third rounds, participants were recruited through two online commercial platforms (Prolific and Qualtrics) between 1 June and 1 December 2021. In all three rounds, participants accessed an online questionnaire in Qualtrics through a link or QR code. The instructions and scales were presented in Catalan. The participants first received general information about the experiment, without being given information about its actual purpose. They were told that they would be asked to give their opinions about a vaccination campaign against COVID-19. They were informed that participation was voluntary, that they could stop taking part at any time without penalty, and that their data would be used for scientific purposes and would be anonymised. Next, they were asked to fill in a consent form. After consenting to participate, participants were randomly assigned to one of the two versions of the experiment. They first read the COVID-19 vaccination advertisement (either in Catalan or Spanish), and then answered questions about it, followed by questions about demographics and self-reported language competence, general language attitudes towards Catalan and Spanish, level of identification with Catalan and Spanish, and degree of belonging to Catalan and Spanish culture. At the end of the experimental session, the participants were thanked for their participation. The participants recruited through Prolific and Qualtrics were paid for participating. On average, the experimental session lasted approximately 13 min. The experiment adhered to the protocol established by the Ethics Assessment Committee Humanities of Radboud University Nijmegen (2019).

2.3 Materials for the experimental part of the study

The experimental part of our study used a Catalan and Spanish version of an advertisement promoting COVID-19 vaccination, inspired by an ad developed for Hispanics in the United States (Ad Council n.d.). The original Spanish text of the US ad (*Volver a disfrutar de la familia comienza por estar informado* ['Enjoying family again begins with being informed']) was adapted to refer more explicitly to vaccination as *Tornar a gaudir de la família comença per estar vacunat* (Catalan) and *Volver a disfrutar de la familia comienza por estar vacunado* (Spanish), ['Enjoying family again begins with getting vaccinated']. The name of the Ad Council was replaced by the name of the official Catalan Health Institute: *Institut Català de la Salut* in the Catalan version and *Instituto Catalán de la Salud* in the Spanish version. The original Ad Council logo was replaced by the logo of the *Generalitat de Catalunya* ('the government of Catalonia'), which is also used in health campaigns in Catalonia (Generalitat de Catalunya 2021: 15). The Spanish slogan from the US campaign, meaning 'It's up to you. COVID-19 vaccination', was retained for the Spanish version (*DeTiDepende. Vacunación* COVID-19) and translated into Catalan for the Catalan version (*DeTuDepen. Vacunació* COVID-19). Finally, both versions referred the reader to a website for more information by saying 'Get informed on ItsUpToYou.cat': *Informa't a DeTuDepèn.cat* in Catalan and *Infórmate en DeTiDepende.cat* in Spanish. The photo of the original ad was changed to depict people of different ages and genders (taken from Scott n.d.). The picture, layout, colours and font were the same in the two versions, but all textual elements were either in Catalan or in Spanish, written by a bilingual Catalan/Spanish speaker. In the current experiment, we only used fully Catalan and fully Spanish ad versions since advertisements that combine the two languages are very rare (Monreal 2006: 14–15).

We created new mock advertisements for this experiment, and not advertisements that had already been published in Catalonia, to avoid bias in participants' response to possible earlier exposure (mere exposure effect, Zajonc [1968]). Moreover, designing a new advertisement allowed us to manipulate only the variable of interest, i.e. the language used in the ad, and to keep constant all other ad content and formal characteristics of the stimuli. This means that if we find a difference between participants' responses to the ads in the two languages, it can only be explained by the language used in the ad, i.e., Catalan or Spanish (the first independent variable in the experiment), and by the first language of the participants (the second independent variable in our experiment). Furthermore, the fact that this mock ad was based on an existing ad used in a real campaign in a different country makes the stimuli more realistic, which strengthens the ecological validity of our study.

Figure 1 shows the Catalan and Spanish versions of the ad used in the experiment.

Catalan-language version

Spanish-language version

Figure 1: Catalan and Spanish versions of the COVID-19 advertisement used in the experiment.

2.4 Instrumentation

2.4.1 Screening questions

The questionnaire began with two questions to collect basic demographic data: an open-ended question about age and a multiple-choice question about gender (with four options: man; woman; I prefer not to describe myself as binary but as fluid gender; I prefer not to say). The questionnaire was distributed among inhabitants of Catalonia, but the following five screening questions were intended to select Catalan/Spanish bilinguals living in the four provinces of Catalonia: (1) Do you live in Catalonia? with two answer options: yes/no); (2) Indicate in which province of Catalonia you live, with four answer options: Barcelona, Girona, Lleida, Tarragona; (3) Are you bilingual?, with two answer options: yes/no); (4) What is your first language?, with three answer options: Catalan, Spanish, Other; and (5) What is your second language? with three answer options: Catalan, Spanish, Other.

2.4.2 Scales with ad-related dependent variables used in experiment (implicit language attitude measures)

All the scales that aimed to measure participants' implicit language attitudes (response to the advertisement) did not refer explicitly to the language used in the advertisement, Catalan or Spanish. Since the only difference between the Catalan version of the ad and the Spanish one was the language used in the ad, any differences in participants'

response to the ad can only be caused by the language of the ad. Therefore, response to the ad is a way of measuring implicit language attitudes.

Attitude towards the COVID-19 advertisement was measured with four seven-point semantic differential scales, unpleasant/pleasant, repellent/attractive, boring/interesting, and bad/good, taken from Jung and Kellaris (2006: 738), following 'I think the advertisement of the institutional campaign is' and one seven-point Likert scale 'I rate this advertisement positively' (based on Koslow et al. 1994: 580; 1 = completely disagree and 7 = completely agree; α = 0.895).

Appropriateness of language use in the ad was measured with one seven-point Likert scale: 'The use of language in the advertisement is appropriate' (1 = completely disagree and 7 = completely agree; constructed for this study (adapted from Van Vaerenbergh and Holmqvist [2013: 1283], and inspired by Fishman and Terry [1968: 303]; Fishman et al. [1968: 1177–1178]).

Perceived cultural respect expressed in the advertisement was measured with one seven-point Likert scale: 'This advertisement respects my culture' (1 = completely disagree and 7 = completely agree; adapted from Koslow et al. 1994: 580).

Attitude towards vaccination against COVID-19 was measured with four seven-point semantic differential scales introduced by 'I think that vaccinating me against COVID-19 is': unnecessary – necessary; ineffective – effective; bad – good; does not protect – protects (scale constructed for this study; α = 0.963).

Vaccination intention was measured with one single seven-point Likert scale: 'I have the intention to be vaccinated against COVID-19' (1 = completely disagree and 7 = completely agree; constructed for this study).

2.4.3 Scales with general language evaluations in survey (direct/explicit language attitude measures)

Self-assessed Catalan and Spanish proficiency was measured using four 7-point scales which measured how fluent participants thought they were in speaking, listening, reading and writing (1 = very low competence; 7 = excellent competence; based on Flaitz 1988: 161; α = 0.924 for Catalan language proficiency; α = 0.919 for Spanish language proficiency).

Explicit general language attitudes, towards Catalan and Spanish were measured with four seven-point semantic differential scales for each language separately: unpleasant – pleasant; has no style at all – has style; repellent – attractive; clumsy – graceful (based on Schoel et al. 2013; α = 0.957 for Catalan and α = 0.952 for Spanish).

Degree of identification with the Catalan and Spanish language was measured separately with one single seven-point Likert scale for each language: 'I identify myself with the Catalan language/the Spanish language' (1 = Completely disagree;

7 = Completely agree; based on Van Hooft et al. 2019: 182). This statement was based on the concepts of 'linguistic identification' (*identificació lingüística*) and 'language of identification' (*llengua d'identificació*) used in official surveys of language use and attitudes in Catalonia (e.g. Generalitat de Catalunya et al. 2011: 189 and 190; Generalitat de Catalunya and Departament de Cultura 2015: 23; Generalitat de Catalunya and Departament d'Ensenyament 2015: 15–16).

Degree of belonging to Catalan and Spanish culture was measured with two seven-point Likert scales, one for each culture: 'To which culture do you think you belong the most: to Catalan culture/to Spanish culture' (1 = Completely disagree; 7 = Completely agree; constructed for this study; adapted from Wan et al. 2007: 18).

2.4.4 Questions about demographic characteristics

The final part of the questionnaire included a number of questions about participants' demographic characteristics: an open-ended question about place of residence and one about nationality; a multiple-choice question about the level of education participants have obtained, with seven levels, ranging from primary school to university studies; and a multiple-choice statement about current vaccination status and intentions, with five options: "You have already been vaccinated against COVID 19" (1) Yes, once; (2) Yes, twice; (3) No, not yet, but I want to be vaccinated; (4) No, and I do not intend to get vaccinated; (5) I prefer not to say. The full version of the questionnaire used in the experiment (in Catalan), followed by an English translation, can be found in Appendix I.

2.5 Participants

A total of 1,430 participants started the experiment. We retained only participants that fully completed the questionnaire and were Catalan/Spanish bilinguals who lived in the autonomous region of Catalonia (provinces of Barcelona, Girona, Lleida and Tarragona). This resulted in 696 participants (49.4 % male, 49.1 % female; 1.5 % indicated that they were non-binary or did not respond; mean age: 37.55; SD = 14.69, min = 18, max = 79; educational level ranged from primary education [1.5 %], secondary education [59.9 %] to tertiary education [38.7 %]).

Of the 696 participants, 358 (51.4 %) reported that Catalan was their first language and 338 (48.6 %) that Spanish was their first language. We established with a two-way ANOVA that self-estimated proficiency in Catalan and Spanish was not influenced by the language of the ad that participants had seen (p = 0.522) nor by an interaction between the language and participants' L1 (p = 0.146). However, self-estimated proficiency in Catalan and Spanish was determined by the self-reported L1

Table 1: Means, standard deviations and paired *t*-tests results for self-rated language competence (1 = low; 7 = high) within L1 Catalan participant group and within L1 Spanish participant group.

	Language proficiency				Paired *t*-test			
	Catalan language		Spanish language		*t*-value	*p* value	Cohen's *d* (effect size)	95 % CI
	M	SD	*M*	SD				
L1 Catalan participants	6.66	0.69	6.70	0.065	0.097	0.335	–	–
L1 Spanish participants	5.98	1.12	6.69	0.078	12.86	***	0.69	[−0.82, −0.58]

***$p < 0.001$.

of the participants (F (1, 692)) = 64.70, $p < 0.001$, $\eta_p^2 = 0.158$). The L1 Spanish participants reported higher proficiency in Spanish than in Catalan, while the L1 Catalan participants indicated they had a similar proficiency in Catalan and Spanish (see Table 1). When we compared the self-reported proficiency in the two languages between the two L1 participant groups, we found that the L1 Catalan participants reported higher proficiency in Catalan than the L1 Spanish participants, while the two L1 participant groups indicated that their Spanish competence was similar (see Table 2).

A series of Chi-square tests (with pairwise *z*-tests with Bonferroni correction) showed no significant relation between language version of the ad (Catalan or Spanish) and participant gender, educational level, L1, L2, vaccination status or intention (p's ranged from 0.187 to 0.817). Another series of Chi-square tests (with pairwise *z*-tests with Bonferroni correction) showed no significant relation between participant L1 (Catalan or Spanish) and participant gender, educational level and vaccination status or intention (all p's ranged from 0.112 to 0.835). L1 Catalan speakers (M = 39.47, SD = 15.54) were slightly older than L1 Spanish speakers (M = 35.52, SD = 13.45) (F (1, 692) = 12.55, $p < 0.001$, $\eta_p^2 = 0.018$), but there were no differences in age between participants who saw the ad in Catalan or in Spanish (F (1, 692) = 1.81, p = 0.179), nor was there a significant interaction between participants' L1 and ad condition (F (1, 692) < 1).

It can be concluded that there were no relevant differences in the characteristics of the participants who saw the Catalan and Spanish ad, and there were only two differences between the L1 Catalan and L1 Spanish participants. The L1 Catalan participants were older than the L1 Spanish participants, but the age difference was small (3.95 years) and the effect size was small. Language proficiency was either similar for L1 and L2 or better for L1 than L2, both within speaker groups and when comparing speaker groups.

Table 2: Means, standard deviations and independent *t*-tests results comparing self-rated language competence (1 = low; 7 = high) between the L1 Catalan participant group and the L1 Spanish participants group.

	L1 language participants				Independent *t*-test			
	L1 Catalan participants		L1 Spanish participants		*t*-value	*p* value	Cohen's *d* (effect size)	95 % CI
	M	SD	*M*	SD				
Catalan language	6.66	0.69	5.98	1.12	9.62	***	0.74	[0.59, 0.89]
Spanish language	6.70	0.65	6.69	0.078	0.04	0.966	–	[−0.10, 0.10]

***$p < 0.001$.

2.6 Statistical treatment

All the data were analysed using the IBM SPSS Statistics version 27 software package. Descriptive statistics were used to describe the sample characteristics. For our statistical tests, we followed common practices in using inferential statistics (e.g. Field 2013; Pallant 2007). We used paired sample *t*-tests to compare mean scores within an L1 participant group, and we employed independent samples *t*-tests to compare the difference between the means of the L1 Catalan group and the means of the L1 Spanish group. With two-way multivariate analysis of variance (two-way MANOVAs), we tested the effects of the two factors in the experiment (Language of the ad and first language of the participants) on multiple dependent variables together. When a two-way MANOVA showed significant results, we conducted follow-up paired and independent *t*-tests samples to compare scores within L1 Catalan and L1 Spanish groups, and between the two L1 Languages groups. We conducted a series of paired and independent sample *t*-tests to compare general language attitudes, identification with the language and sense of belonging to Catalan/Spanish culture within and between the two bilingual groups (L1 Catalan and L1 Spanish). Subsequently, we conducted a two-way MANOVA to check if participants' general language attitudes were influenced by participants' self-reported first language, by their exposure to the Catalan or Spanish language versions of the COVID-19 vaccination advertisement, or by the interaction between these two factors. Finally, we conducted a two-way MANOVA to test if participants' first language and the language of the advertisement, i.e., Catalan versus Spanish, influenced their implicit language attitudes, i.e., evaluations, attitudes and intentions towards the COVID-19 institutional advertisement.

3 Results

3.1 General attitudes to Catalan and Spanish language and culture (explicit language attitudes)

Overall, results indicate that participants preferred their first language to their second language, for all dimensions measured: general language attitudes (H1), identification with the language (H2) and sense of belonging to Catalan/Spanish culture (H3). A series of paired samples *t*-tests showed that the L1 Catalan participants had more favourable general language attitudes towards Catalan than toward Spanish, identified more with the Catalan language than with the Spanish language, and felt a greater sense of belonging to Catalan culture than to Spanish culture.

Table 3: Means, standard deviations and paired *t*-tests results for general attitudes to Catalan and Spanish language and culture within first language group of participants (1 = low; 7 = high).

First language group of participants	Language descriptive statistics				Paired *t*-tests	
	Catalan language		Spanish language			
	M	SD	*M*	SD	*p* value	Cohen's *d* (effect size)
L1 Catalan participants (*n* = 358)						
General language attitudes	6.40	1.21	5.97	1.38	***	1.06
Identification with the language	6.55	0.097	5.13	1.81	***	2.02
Sense of belonging to Catalan culture	6.36	1.06	3.90	2.00	***	2.34
L1 Spanish participants (*n* = 338)						
General language attitudes	5.75	1.39	6.01	1.20	***	1.22
Identification with the language	4.99	1.72	6.24	1.04	***	1.74
Sense of belonging to Spanish culture	4.88	1.70	5.54	1.53	***	2.09

***$p < 0.001$.

Conversely, the L1 Spanish participants had more favourable general language attitudes towards Spanish than toward Catalan, identified more with the Spanish language than with the Catalan language, and felt a greater sense of belonging to Spanish culture than to Catalan culture (for descriptive and inferential statistics, see Table 3).

By means of two-way MANOVA analysis, we tested whether general language attitudes were influenced by the participants' self-reported first language and we checked whether exposure to the Catalan or Spanish language versions of the COVID-19 vaccination had affected these attitudes, for Catalan and Spanish separately. We also compared to what extent the L1 Catalan sample and the L1 Spanish sample differ in their general attitudes.

For Catalan, a two-way MANOVA with ad language condition and participants' first language as factors showed an effect of self-reported first language on general language attitude towards Catalan, identification with the Catalan language, and belonging to Catalan culture (F (3, 690) = 84.30, $p < 0.001$, $\eta_p^2 = 0.268$), but no effect of the language of the ad that participants saw (F (3, 690) = 2.12, $p = 0.096$), and no interaction between participants' self-reported first language and language of the ad (F (3, 690) < 1). L1 Catalan participants showed a more positive general language attitude towards Catalan than L1 Spanish participants. L1 Catalan participants showed a higher degree of identification with the Catalan language than the L1 Spanish participants. L1 Catalan participants also indicated a higher degree of belonging to Catalan culture than the L1 Spanish participants (see Table 4).

Table 4: Means and standard deviations and independent comparison tests between L1 Catalan participants and L1 Spanish participants for general attitudes to Catalan and Spanish language and culture (1 = low; 7 = high).

Dependent variables by language	Descriptive by first language				Independent comparisons tests (tests of between-subjects effects)		
	L1 Catalan participants (n = 358)		L1 Spanish participants (n = 338)				
	M	SD	*M*	SD	*F*	*p* value	η_p^2 (effect size)
Catalan language							
General language attitudes	6.40	1.21	5.75	1.39	43.36	***	0.059
Identification with the language	6.55	0.097	4.99	1.72	221.06	***	0.242
Sense of belonging to Catalan culture	6.36	1.06	4.88	1.70	192.61	***	0.218
Spanish language							
General language attitudes	5.97	1.38	6.01	1.20	2.26	0.080	0.010
Identification with the language	5.13	1.82	6.24	1.04	95.30	***	0.121
Sense of belonging to Spanish culture	3.90	2.00	5.54	1.53	145.04	***	0.173

***$p < 0.001$.

For Spanish, a two-way MANOVA with ad language condition and participants' first language as factors showed an effect of self-reported first language on general language attitude towards Spanish, identification with the Spanish language, and belonging to Spanish culture (F (3, 690) = 56.65, $p < 0.001$, $\eta_p^2 = 0.198$), but no effect of the language of the ad that participants saw (F (3, 690) $F < 1$), and no interaction between participants' self-reported first language and language of the ad (F (3, 690) = 2.85, $p = 0.036$; Levene's test was significant, so the significance level was set at $p < 0.01$; see Pallant 2007: 261–262). There was no difference in L1 general language attitude towards Spanish between L1 Spanish participants and L1 Catalan participants. L1 Spanish participants showed a higher degree of identification with the Spanish language than the L1 Catalan participants. L1 Spanish participants also indicated a higher degree of belonging to Spanish culture than the L1 Catalan participants. Table 4 shows the descriptives and statistical tests for general attitudes to Catalan and Spanish language and culture of the L1 Catalan sample compared with L1 Spanish sample.

These findings show that participants' general language attitudes were not influenced by the language of the ad they had seen. For none of the general language attitudes measured, was there a direct effect of the language of the ad that participants saw, nor was there an interaction effect between participants' self-reported first language and language of the ad.

3.2 Response to the advertisements (implicit language attitudes)

Results indicate that participants' response to the COVID-19 vaccination advertisement did not depend on the language of the ad nor on their first language for attitude towards the ad (H4a), attitude towards vaccination (H4b), and vaccination intention (H4c). However, the language of the ad and participants' first language did influence the perceived cultural respect expressed in the advertisement (H5) and the perceived appropriateness of the language used in the advertisement (H6). With respect to H5 and H6, the L1 Catalan participants felt the Catalan ad expressed more cultural respect and had more appropriate language than the Spanish ad, while L1 Spanish participants evaluated these two aspects in a similar, positive way for the Catalan and Spanish versions of the ad.

A two-way MANOVA with ad language condition and participants' first language as factors showed no effect of self-reported first language on the dependent variables attitude towards the COVID-19 advertisement, attitude towards vaccination against COVID-19, vaccination intention, appropriateness of language use in the ad and perceived cultural respect expressed in the ad (F (1, 688) = 2.11, p = 0.063). However, the language of the ad that participants saw did have an effect on the dependent variables (F (1, 688) = 19.83, $p < 0.001$, $\eta_p^2 = 0.126$), and there was an interaction effect of participants' self-reported first language and language of the ad (F (1, 688) = 15.56, $p < 0.001$, $\eta_p^2 = 0.102$).

Further tests of between-subjects effects revealed a main effect of the language of the advertisement on appropriateness of language use in the ad (F (1, 692) = 76.87, $p < 0.001$, $\eta_p^2 = 0.100$) and perceived cultural respect expressed in the advertisement (F (1, 692) = 58.61, $p < 0.001$, $\eta_p^2 = 0.078$), and also an interaction effect of participants' self-reported first language and language of the ad on appropriateness of language use in the ad (F (1, 692) = 60.53, $p < 0.001$, $\eta_p^2 = 0.080$) and perceived cultural respect expressed in the advertisement (F (1, 692) = 49.83, $p < 0.001$, $\eta_p^2 = 0.067$). All other main effects and interaction effects were not significant (the effects of the participants' L1 were left out of consideration, because of the absence of a significant effect of the participants' L1 in the multivariate analysis). To analyse the significant interactions, paired samples t-tests and independent samples t-tests were conducted.

3.2.1 Appropriateness of the language use in the ad

Overall, the response of the L1 Catalan participants was more positive when the advertisement was in Catalan than when it was in Spanish, while there was no difference in the response of the L1 Spanish participants to the ads in the two

languages. A paired samples *t*-test showed that L1 Catalan participants perceived the language used in the ad as more appropriate when the language of the ad was Catalan than if the ad was in Spanish, while the L1 Spanish participants perceived the language used in the ad as equally appropriate in the Catalan and Spanish ad (see Table 5). Independent samples *t*-tests indicated that the L1 Catalan participants perceived the language used in the ad as more appropriate than the L1 Spanish participants when the language of the ad was Catalan, while the L1 Spanish participants perceived the language used in the ad as more appropriate than the L1 Catalan participants when the language of the ad was Spanish (See Table 6).

3.2.2 Perceived cultural respect expressed in the ad

A paired sample *t*-test showed that L1 Catalan participants perceived cultural respect expressed in the ad as higher when the language of the ad was Catalan than if the ad was in Spanish, while the L1 Spanish participants perceived equal cultural respect in the Catalan and Spanish ad (see Table 5). Independent samples *t*-tests indicated that the L1 Catalan participants perceived the cultural respect expressed in the advertisement as higher than the L1 Spanish participants when the language of the ad was Catalan, while the L1 Spanish participants perceived the cultural respect expressed in the advertisement as higher than the L1 Catalan participants when the language of the ad was Spanish (see Table 6).

4 Conclusion and discussion

This study aimed to contribute new insights into the study of languages in contact by comparing bilingual individuals' explicit general language attitudes and implicit language attitudes towards their first and second language in health communication in a multilingual society, through a combination of survey and experimental methods. We investigated to what extent L1 Catalan and L1 Spanish speakers in Catalonia differ in their general attitudes to Catalan and Spanish (explicit language attitudes) and in their reactions to the use of these languages in health advertising, specifically in an advertisement promoting COVID-19 vaccination (implicit language attitudes). As far as we know, this is the first study of its kind in a European multilingual context.

The results of our study showed that, overall, participants' general attitudes to their L1 were more positive than their general attitudes to their L2. Both L1 Catalan participants and L1 Spanish participants had more positive general language attitudes towards their L1 than towards their L2 (H1), identified more with their L1 than with their L2 (H2) and expressed a greater sense of belonging to L1 culture than to L2

Table 5: Means, standard deviations and paired sample *t*-tests for the five dependent variables measuring response to the advertisements in function of participants' self-reported first language by language of the advertisement (1 = low; 7 = high).

First language group	Ad language descriptive statistics				Paired sample *t*-tests			
	Catalan ad		Spanish ad					
L1 Catalan participants	*n* = 173		*n* = 185					
	M	SD	*M*	SD	*t*	*p* value	Cohen's *d* (effect size)	95 % CI
Appropriateness of language use in the ad	6.03	1.49	3.85	2.09	11.56	***	1.21	[1.81, 2.55]
Perceived cultural respect expressed in the ad	5.91	1.39	4.02	2.08	10.21	***	1.07	[1.53, 2.26]
Attitude towards the COVID-19 advertisement	4.80	1.55	4.83	1.47	1.45	0.080	1.52	[−0.50, 0.36]
Attitude towards vaccination against COVID-19	5.89	1.72	5.93	1.68	0.259	0.795	1.70	[−0.23, 0.18]
Vaccination intention	6.18	1.63	6.33	1.55	0.896	0.371	1.59	[−0.30, 0.011]
L1 Spanish participants	*n* = 169		*n* = 169					
Appropriateness of language use in the ad	5.28	1.50	5.15	1.81	0.720	0.472	1.66	[−0.13, 0.29]
Perceived cultural respect expressed in the ad	5.38	1.54	5.31	1.67	0.440	0.661	1.60	[−0.16, 0.26]
Attitude towards the COVID-19 advertisement	4.57	1.49	4.98	1.46	0.909	0.364	1.46	[−0.31, 0.11]
Attitude towards vaccination against COVID-19	6.11	1.30	5.90	1.62	1.34	0.182	1.46	[−0.07, 0.36]
Vaccination intention	6.36	1.35	6.19	1.65	1.01	0.313	1.50	[−0.13, 0.32]

***$p < 0.001$.

Table 6: Means, standard deviations and independent *t*-tests results for the five dependent variables measuring response to the advertisements in function of participants' self-reported by first language and language of the ad (1 = low; 7 = high).

Dependent variables	Descriptive by first language				Independent *t*-tests			
	L1 Catalan participants *n* = 173		L1 Spanish participants *n* = 169					
	M	SD	*M*	SD	*t*	*p* value	Cohen's *d* (effect size)	95 % CI
Catalan ad								
Appropriateness of language use in the ad	6.03	1.49	5.28	1.50	4.77	***	0.36	[0.44, 1.07]
Perceived cultural respect expressed in the ad	5.91	1.39	5.38	1.54	3.33	***	0.36	[0.22, 0.84]
Attitude towards the COVID-19 advertisement	4.80	1.55	4.57	1.49	0.210	0.834	1.51	[−35, 0.29]
Attitude towards vaccination against COVID-19	5.89	1.79	6.11	1.30	1.38	0.166	1.52	[−55, 0.09]
Vaccination intention	6.18	1.63	6.36	1.35	1.08	0.279		[−0.49, 0.14]
Spanish ad	*n* = 185		*n* = 169					
Appropriateness of language use in the ad	3.85	2.09	5.15	1.81	6.24	***	0.66	[−1.70, −0.87]
Perceived cultural respect expressed in the ad	4.02	2.08	5.31	1.67	6.46	***	0.68	[−1.69, −0.90]
Attitude towards the COVID-19 advertisement	4.38	1.47	4.98	1.46	2.63	0.009+++	1.47	[−489, −0.07]
Attitude towards vaccination against COVID-19	5.93	1.68	5.90	1.62	0.180	0.857	1.65	[−1.89, 0.23]
Vaccination intention	6.33	1.55	6.19	1.65	0.827	0.409	1.59	[−121, 0.28]

**$p < 0.01$; ***$p < 0.001$; +++ significant result overruled by the non-significant MANOVA.

culture (H3), with large effect sizes in all cases. A similar picture emerged when comparing attitudes between the two L1 groups. The L1 Catalan participants had more positive general attitudes towards Catalan, identified more with Catalan, and expressed a greater sense of belonging to Catalan culture than L1 Spanish participants, with effect sizes ranging from medium to large. Similarly, the L1 Spanish participants identified more with Spanish culture and had a greater sense of belonging to Spanish culture than L1 Catalan participants, with effect sizes again ranging from medium to large. However, the L1 Spanish participants did not differ from the L1 Catalan participants in their attitude towards Spanish. In conclusion, overall our study has confirmed hypothesis 1, 2 and 3 that there is first language preference regarding general language attitudes, identification with the language and cultural belonging.

Participants' reactions to the use of Catalan and Spanish in an advertisement promoting COVID-19 vaccination showed preference for L1 on some but not all measures. The use of Catalan and Spanish evoked similar responses for L1 Catalan and L1 Spanish participants in attitude towards the ad (H4a), attitude towards vaccination (H4b) and vaccination intention (H4c). For all three measures, response was positive. Thus, our findings confirm hypothesis 4 that the language of the ad would not influence participants' response to the ad in terms of persuasiveness. For perceived cultural respect expressed in the advertisement (H5) and appropriateness of the language used in the advertisement (H6), the Catalan L1 participants showed more positive evaluations when the ad was in Catalan than when it was in Spanish, while the L1 Spanish participants did not differ in their evaluations of the Catalan and Spanish versions of the ad. When comparing scores between the L1 Catalan participants and the L1 Spanish participants, each group was found to indicate that the ad in their own L1 showed more cultural respect and more appropriate language than the group for whom the ad was in their L2. Therefore, our findings support hypotheses 5 and 6 that use of the participants' L1 in an advertisement would lead to a greater sense of cultural belonging and greater perceived appropriateness of the language of the ad.

Our findings that, overall, L1 Catalan and L1 Spanish participants' general attitudes towards their L1 were more favourable than their attitudes towards their L2 (more positive L1 general language attitudes, stronger identification with L1 and greater sense of belonging to L1 culture) are in line with results of earlier language-attitude studies conducted in Catalonia (Huguet and Janés 2008; Ianos et al. 2020; Madariaga et al. 2016) and with the general language attitudes revealed in Van Hooft et al. (2019). For instance, a survey by Ianos et al. (2020) found that L1 Catalan participants preferred Catalan to Spanish and that L1 Spanish speakers preferred Spanish to Catalan. Van Hooft et al. (2019) showed that L1 Catalan speakers had more favourable attitudes towards Catalan and identified more with Catalan than Spanish,

while, conversely, L1 Spanish speakers had more favourable attitudes towards Spanish and identified more with Spanish than with Catalan. These findings confirm the general tendency that speakers prefer their own L1 to their L2 or foreign languages (Dragojevic et al. 2021; Ferguson 1968; Hilton and Gooskens 2013; Kinzler et al. 2007; Ytsma 2007: 162).

There was one exception to the general L1 preference: both L1 Catalan and L1 Spanish participants had similar, very positive, language attitudes towards Spanish. Although this does not provide direct evidence for the observation, based on interviews and focus groups, that some inhabitants of Catalonia no longer see language as an expression of their identity (Frekko 2013; Pujolar and González 2013; Woolard and Frekko 2013), it does indicate that positive language attitudes are not limited to people's L1. A possible explanation for the positive attitudes to Spanish on the part of both L1 Catalan and L1 Spanish participants could be the fact that Spanish is the most widely used language in Catalonia by both L1 Spanish and L1 Catalan speakers (Institut d'Estadística de Catalunya [Idescat] 2023), and is, therefore, seen as an appealing language by both groups.

Our findings that the use of Catalan and Spanish evoked similar responses for L1 Catalan and L1 Spanish participants in attitude towards the ad, attitude towards vaccination, and vaccination intention are in accordance with earlier experimental findings showing absence of effects of L1 versus L2 in product advertising (Basque versus Spanish in the Basque Country, Monge-Benito et al. [2019]; Catalan versus Spanish in Catalonia, Van Hooft et al. [2019]; English versus Korean for Korean American consumers, Dublish [2001]) and in health advertising, (English versus Spanish for US Hispanics in Kelly et al. [2010]). Our findings that the ad was perceived as showing more cultural respect and more appropriate language by participants for whom it was in their L1 than by participants for whom the ad was in their L2 are in agreement with Koslow et al.'s (1994) findings that Hispanic consumers in the USA regarded an advertiser as more culturally sensitive when advertisements included Spanish words or were fully in Spanish than when the same advertisements were fully in English. It can be concluded that in our study and a number of other studies, the effect of L1 preference (Ferguson 1968; Kinzler et al. 2007) and of language accommodation (Giles et al. 1973, 1991) in a specific advertising context was found for variables that could be argued to be closer to the language choice in the advertisements (language appropriateness and cultural sensitivity) and not for variables relating to the persuasiveness of the ad (attitude towards the ad, attitude towards what is promoted, and behavioural intention). In our study, the effects for language appropriateness and cultural sensitivity are similar to those for general language evaluations (general language attitudes, identification with language and cultural belonging). It would, therefore, appear that the ad-related variables that are close to the language manipulation (perceived language appropriateness and cultural

sensitivity) more or less directly reflect general language evaluations. However, the variables relating to the ad's persuasiveness would not appear to be determined by such general language evaluations but by other vaccination-related considerations. This idea is supported by the findings that ad-based attitudes and intentions regarding COVID-19 vaccination were positive for both L1 Catalan and L1 Spanish participants. Future research should investigate the relationship between general language evaluations (explicit language attitudes) and ad-related evaluations (implicit language attitudes) through correlation and mediation analyses.

Similar to our findings that the ad was perceived as showing more cultural respect and more appropriate language by participants for whom it was in their L1 than by participants for whom the ad was in their L2, L1 Catalan participants evaluated the ad as showing more cultural respect and the language being more appropriate when the ad was in Catalan than when it was in Spanish. However, the L1 Spanish participants did not differ in their evaluations of cultural respect and language appropriateness for the Catalan and Spanish versions of the ad, assessing both as equally high. The L1 Spanish participants' similar evaluations may possibly be explained by the fact that Catalan was reintroduced in primary schools in Catalonia in 1975, after having been banned for almost forty years under the Franco regime, and has been the language of reference in primary and secondary schools since 1983 (Generalitat de Catalunya and Departament d'Ensenyament 2015). The majority of L1 Spanish participants were born in or after 1975, which means that they are likely to have become competent in Catalan as their L2 at school as part of their linguistic repertoire and recognize the importance of Catalan. As a result, L1 Spanish participants are likely to consider the use of both their L1 (Spanish) and their L2 (Catalan), by a Catalan institution (the Catalan Health Institute, the sender of the COVID-19 vaccination advertisement) as appropriate and an expression of cultural respect in the society of which they are a part. A possible explanation for L1 Catalan speakers' assessment of the use of Catalan by a Catalan institution as more appropriate and an expression of greater cultural respect than the use of Spanish is that for such L1 Catalan speakers Catalan is more associated with Catalonia. There is supporting evidence for this explanation in the finding that for the L1 Catalan participants there is a stronger relation between language and cultural belonging than for L1 Spanish participants. This may suggest that speakers of a minoritized language (in this case Catalan) have stronger preferences for and like to see their L1 used in official communications, whereas speakers of the dominant majority language (in this case Spanish) feel less strongly about the visibility of their (already dominant) language.

When we compare the findings for general language evaluations (explicit language attitudes) and ad-specific evaluations (implicit language attitudes), we find that the two types of evaluation do not show the same patterns. Whereas general

language evaluations (general language attitudes, language identification and cultural belonging) overall show an L1 preference, some ad-specific evaluations overall also exhibit L1 preference (cultural respect expressed in the ad, appropriateness of the language used in the ad), but other ad-specific evaluations do not (attitude towards the ad, attitude towards vaccination and vaccination intention). Other studies similarly show a lack of correspondence between general language attitudes and ad-specific attitudes for product advertising (Koslow et al. 1994; Kubat and Swaminathan 2015, study 2 and 3; Van Hooft et al. 2019) and health advertising (Kelly et al. 2006). Research into explicit and implicit language attitudes has also shown that there may be discrepancies between the two types of attitude (Adams 2019; McKenzie and Carrie 2018). This corroborates the finding in several sociolinguistic studies that general language attitudes may differ from specific language attitudes, depending on the situations and the speakers (Schoel et al. 2013: 22). In the current study, general language attitudes were measured with scales specifically designed to assess attitudes towards languages (and not their speakers), taken from Schoel et al. (2013). The ad-specific attitudes were measured with scales assessing dimensions commonly investigated in research regarding the persuasiveness of health and product advertising – attitude towards the ad, attitude towards the targeted behaviour and behavioural intention (cf. Hornikx and O'Keefe 2009; Huang and Xu in press) – as well as scales assessing the perceived sociolinguistic appropriateness of the language used in the ad (partly based on Koslow et al. 1994). In addition, future research should also investigate both general and specific language attitudes using common speaker evaluation dimensions such as status, solidarity and dynamism (e.g. Fuertes et al. 2012) and even more indirect implicit measures, such as Implicit Association Tests (e.g. Ianos et al. 2020).

Our study has a number of limitations. One limitation concerns the formulation of the item used to measure the extent to which participants identify with Catalan and Spanish ('I identify myself with the Catalan language/the Spanish language'). The question is whether the formulations of this item was clear to participants and measured the extent to which participants regard each language as part of their identity, as was its aim. The scores on this item demonstrate higher identification with Catalan for L1 Catalan participants and higher identification with Spanish for the L1 Spanish participants. This suggests that the item at least measured a relevant dimension. In future research, follow-up questions should be included to probe how participants interpret this item. In addition, more explicit items should be included to measure the relation between language and identity, for instance "The Catalan language/Spanish language is part of my identity: totally disagree – totally agree".

Another limitation concerns the formulation of the item used to measure participants' views on the appropriateness of the use of Catalan or Spanish in the ad: 'The use of language in the advertisement is appropriate'. This item does not explicitly

mention Catalan or Spanish, which means participants may have interpreted it as referring to these languages as intended, but may also have interpreted it differently, for instance as relating to appropriateness in terms of register and style. In addition, the item does not specify what the appropriateness of the use of language is supposed to relate to. Similar to identification with the language, the results show that the L1 Catalan participants considered the use of Catalan more appropriate and the use of Spanish less appropriate than did the L1 Spanish participants. This again suggests that the item was a valid measure of a relevant dimension. However, in future research the item could be reformulated to make it refer explicitly to language choice and to specify the kind of communication that language choice should be appropriate for, for instance through a formulation such as "The use of Catalan instead of Spanish in this advertisement is appropriate for communication between Catalan authorities and people living in Catalonia: totally disagree – totally agree". The item could be split into different items to ask participants to reflect on appropriateness for different target groups (e.g. "The use of Catalan instead of Spanish in this advertisement is appropriate for communication between Catalan authorities and people living in Catalonia whose first language is Spanish"). The potential drawback of such specifications is that they make participants explicitly aware of considerations that influence language choice and make it less likely that participants respond spontaneously and intuitively.

In our study, we argued that measuring evaluations of advertisements in either Catalan or Spanish without making participants aware that they were expressing attitudes about these languages was a way of eliciting implicit language attitudes. A similar argument has been offered for matched-guise experiments as implicit language attitude measures (e.g. McKenzie 2015). However, it has also been argued that so-called indirect measures such as speaker evaluations using matched guise and verbal guise do not actually measure implicit unconscious language attitude, since they involve some degree of conscious reflection, and the use of more implicit attitude measures such as the Implicit Association Test is therefore advocated (Adams 2019; McKenzie and Carrie 2018; Pharao and Kristiansen 2019). In addition, we would recommend including measures to check how conscious or unconscious participants are of expressing language attitudes when different types of language attitude measurements are employed.

An innovative direct approach to studying attitudes towards languages in contact was taken by Schuring et al. (this issue), who asked Belgian Dutch participants to indicate the frequency with which they expect Belgian Dutch speakers of different ages and in different social roles to use English loanwords and the extent to which this would bother them. Such a direct approach could also be applied to the Catalan context by asking bilinguals with which types of speaker and communication situations they associate Catalan and Spanish, in order to gain further insights into the perceived appropriateness and status of the two languages in Catalonia.

Furthermore, to gain more insight into the effectiveness of the use of Catalan and Spanish in messages in Catalonia, eye-tracking techniques could be used to determine which of the two languages attracts most attention from Catalan/Spanish bilinguals and leads to faster reading patterns. Such a study would build on the innovative eye-track experiments examining the effect of the use of English versus German and Dutch in job ads on the attention of Dutch and German readers (Hilberink-Schulpen et al. 2016; Nederstigt and Hilberink-Schulpen, this issue).

The contribution of our study is that it has for the first time investigated L1 preference in terms of general language attitudes (explicit measurement) and response to a health advertisement (implicit measurement of language attitudes). It is the first to do so for Catalan and Spanish in Catalonia. It expands on earlier studies by studying a wider range of participants with regard to age and education. Its findings provide further evidence for L1 preference, both for general language attitudes and for the perceived appropriateness of the language and cultural respect shown in a specific health advertisement (cf. Ferguson 1968; Hilton and Gooskens 2013; Ianos et al. 2020; Kinzler et al. 2007; Koslow et al. 1994; Van Hooft et al. 2019). These findings add to earlier research by showing convergence between implicit and explicit language attitudes (contra Adams 2019; Hassall et al. 2008; Kristiansen 2010; Lambert et al. 1965; McKenzie 2015; McKenzie and Carrie 2018). At the same time, our study confirms that the language of the ad does not influence persuasiveness (cf. Kelly et al. [2010] for health advertising; Dublish [2001]; Monge-Benito et al. [2019]; Van Hooft et al. [2019] for product advertising).

In terms of practical implications for designers of health communication advertisements in Catalonia, the current study showed that the use of Catalan or Spanish made no difference for traditional measures of persuasion: attitude towards the ad, attitude towards the behaviour proposed, and behavioural intention. All three were positive. These findings can be taken to imply that both languages can be used in such health communication ads. For the other ad-related measures, perceived appropriateness of the language used and cultural respect expressed in the ad, there were no differences between the two language versions of the ad for the L1 Spanish participants. Again, these findings suggest that both languages could be used equally effectively in health communication ads for L1 Spanish speakers. However, L1 Catalan participants found that the Catalan ad contained more appropriate language and showed more cultural respect than the Spanish one. These findings imply that Catalan should be used in health communication ads for L1 Catalan speakers. All these implications should be considered cautiously, since only one health advertisement was studied in the current experiment. In order to provide a better basis for recommendations for language choice in health advertising, more research is needed involving a variety of health advertisements (cf. Jackson 1992).

Catalonia is only one example of a region with two officially recognized languages. There are many other regions in Spain and in the rest of world in which different languages are used, either officially recognized or not, each with its own historical, social and sociolinguistic circumstances. Future research should investigate to what extent first-language preference is found in such regions, both in terms of general language evaluations and response to specific instances of the use of speakers' L1 and L2.

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