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Misremembering Motives: The Unreliability of Voters' Memories of the Reasons for their Vote

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Abstract

In the aftermath of important votes, people are often asked to report why they voted as they did. In the current study, we assessed the consistency of these reports over a one-year period. Participants reported their reasons for voting Yes or No in the 2018 Irish abortion referendum one week, three months, six months and 12 months post-referendum. While the top reasons given by Yes and No voting groups remained relatively consistent over time, there was significant individual inconsistency. Furthermore, when presented with a list of possible reasons at the end of the study, many participants failed to select reasons that they had previously reported. The findings suggest that voter memory of factors that influenced their vote can be unreliable. Moreover, reports are influenced by how the reasons are elicited (for example by open-response or selection from a list).

Keywords: Memory, decision-making, reasoning, metacognition, politics

General Audience Summary

In the wake of significant political events like presidential elections or national referendums, it is common to wonder how the winning side won voters over. Media outlets run features where they ask groups of voters (e.g. Trump supporters in the US presidential election or Leave voters in the Brexit referendum) why they voted as they did. Journalists and political campaigners then draw conclusions based on these findings. For instance, they reason that, if immigration is reported as an important reason behind voters' choices, future campaign efforts should focus on immigration. But how consistent are these recollections? We followed 601 voters in the year following the 2018 abortion referendum in Ireland, asking them to report the reasons behind their voting choice one-week, three-months, six-months and 12-months post-referendum. We first analyzed consistency on a group level, assessing whether the top reasons given by the Yes and No sides remained consistent over time. The findings showed some inconsistency, but as the main reasons were so much more popular than others, the top reasons didn't change dramatically. We then analyzed consistency on an individual level, assessing whether individual voters were likely to give the same reasons each time they were surveyed. The vast majority of participants either forgot some reasons that were previously given or added in some new reasons in place of or along with the original reasons. At the end of the study, we presented participants with a list of potential reasons, to see if this inconsistency could be overcome with a prompt. However, many participants failed to select previously stated reasons, suggesting genuine memory distortion. The findings have important implications for media and political campaigners, suggesting that voters' recollections of the reasons behind their choice can be unreliable.

After a political outcome is known, voters are often surveyed and asked why they voted the way they did. Politicians, lobbyists and other interested parties may then use this information in future campaigns. But how accurate are voters' recollections? Decades of human memory research have demonstrated that our recollections are often inaccurate (Loftus, 2005). People often misremember voting in elections that they did not vote in (Abelson et al., 1992; Stocké & Stark, 2007) and inaccurately recall how they felt about political candidates and election outcomes (Kaplan et al., 2016; Levine, 1997). There is anecdotal evidence for memory errors when recalling reasons for voting. In an article published in The Irish Times, when asked why he voted Leave in the Brexit referendum, one man said he grew concerned about immigration after a terrorist attack at an Ariana Grande concert in Manchester; 'It made me think, hang on, I don't want all these North Africans coming in through Europe, and I still don't' (O'Connell, 2019). In reality, that incident happened almost a full year *after* the Brexit referendum. The current study followed voters for one year after the 2018 referendum on abortion in Ireland, assessing the consistency of voters' memory of why they voted as they did.

There is evidence that voters do not accurately recall *when* they made a particular voting choice. Plumb (1986) tracked voters during the 1980 US Presidential election and found that just 40% of voters accurately recalled when they had selected their candidate. Amongst those who said 'I knew I would vote for X all along', just 13% had consistently selected the candidate in previous surveys. In addition, research has shown that a substantial number of voters do not accurately recall what party they voted for (Atkeson, 1999; Dassonneville & Hooghe, 2016).

Reports of prior motivations are likely to be similarly inconsistent, yet these recollections are often relied upon in legal contexts. In 2002, the musician Eminem was sued for copyright infringement for a particular song on his album The Marshall Mathers LP. As part of his defence, Eminem's legal team surveyed individuals who had purchased the album, asking why they bought it. Finding that less than 1% of purchasers reported buying the album specifically for that track, Eminem's lawyers argued that it did not contribute significantly to the album's sales. To test the consistency of these recollections, Kaasa et al. (2011) asked participants to name the most recent CD they had purchased and to list any reasons behind that purchase (e.g. because they liked the artist, because they needed the CD for a particular purpose, etc.). They then surveyed the same participants again, finding that just 21% of participants reporting entirely consistent reasons at the six-month follow-up. A further 30% forgot earlier reasons, while the remaining 49% included new reasons.

It is not clear how Kaasa and colleagues' findings might translate to more complex decisions, or how memories for motivations may change across multiple follow-ups. Flashbulb memory studies have demonstrated that even memories for important events can be forgotten and distorted (Hirst & Phelps, 2017; Neisser & Harsch, 1992; Talarico & Rubin, 2007), with rapid forgetting that slows about one year after the event (Hirst et al., 2010). The current study will assess whether a similar forgetting curve is evident for memories of motivations, as well as whether consistency is associated with media consumption, discussion of the event with friends and family, or personal relevance of the referendum, all of which have been found to relate to memories for significant public events (Hirst & Phelps, 2016).

It is important to stress that the current study can only investigate *consistency* of reported reasons, not the *accuracy* of these reports. As outcomes are known to bias memories of pre-event expectations (so-called 'hindsight bias'; Roese & Vohs, 2012), it is possible that the baseline answers (recorded after the referendum result was known) do not reflect participants' true motivations. Individuals may be relatively poor at identifying the causes of their behaviour (Nisbett & Wilson, 1997) and voters may have limited understanding of what issues were most important to them (Bartle & Laycock, 2012). Choice blindness and memory blindness studies show that individuals often fail to notice a mismatch between their choice and a non-selected option later presented to them as their original choice, going on to provide detailed reports of what motivated a choice that they never actually made (Johansson et al., 2005; 2006; Cochran et al., 2016). If it is possible to fluently, and apparently without conscious intent, describe the decision-making process for a choice that was never made, what does this mean for how people generally report their motivations? It is possible that reasons are not directly retrieved from memory, but instead are reconstructed based on current assumptions about what would have motivated such behavior. This is well documented in the case of emotional memories, which are often informed by how people feel they *would* have felt at the time (Breckler, 1994; Levine, 1997; 2001). Galotti (1995) also found that students' recall of the criteria they had used to select their college were influenced by their current beliefs about the criteria they ought to have used.

A reconstructive model of memory for decision-making would not predict the steep forgetting curve that has been observed in flashbulb memory studies (Hirst et al., 2015), but instead would predict that consistency would vary in line with other factors, such as

changing attitudes and beliefs (Levine et al., 2001), and thus would not follow a predictable course.

If we accept that memories for motivations for both minor and major decisions are reconstructed and subject to interference (Galotti, 1995), how we solicit these memories may also impact consistency (Loftus, 1975). A potential form of interference with important applied implications is the use of recognition memory rather than recall (i.e. 'did you vote Yes because of reason X?' vs. 'Why did you vote Yes?'). It is not clear if responses derived from two different methods (recall vs. recognition) can be fairly compared, or how that may impact consistency.

The Current Study

The 2018 Irish abortion referendum concerned the repeal of the eighth amendment, which stated that 'the unborn' had a right to life equal to that of the mother. This amendment meant that abortion was only permitted where there was a substantial risk to the life of the mother (Reidy, 2020). Thousands of women travelled from Ireland to the UK every year to access abortion services, and an increasing number of abortion pills were purchased online (Sheldon, 2018). In the referendum, voters could vote Yes (to repeal this amendment and allow the government to legislate for abortion) or No (to retain the amendment). The Irish government published drafts of the proposed legislation prior to the referendum.

Turnout for the referendum was high (64%), and the Yes side won in an unexpected landslide, with 66% voting to repeal (Bohan, 2018). After the May referendum, legislation was proposed in September, passed into law in December, and abortion services were made available from January 1st 2019. Abortion access remained extremely restricted in Northern

Ireland. Abortion legislation was still therefore a regular topic of public conversation in the 12 months following polling day, as is often the case with important votes.

The current study addressed four key research questions:

1. At an aggregate level, are the top reasons given by Yes and No voters as a group consistent over time?

2. At the individual level, do voters consistently report the same reasons for their vote?

3. Does consistency vary in line with individual differences in referendum-engagement (i.e. media consumption, perceived future impact of the amendment, etc.)?

4. How does response format impact consistency at the aggregate and individual level?

Method

Participants

A total of 1630 participants were recruited for this study in the week after the referendum. Some participants completed a study of their memory for fake news one week before the referendum (Murphy et al., 2019) and then provided their email address to be contacted for the current study (*n* = 1151). These participants were recruited via university student emails, social media posts and an article on TheJournal.ie (an Irish online news website). A further 481 participants were recruited after the referendum, via a different article on TheJournal.ie

and social media posts. The study was described as a year-long investigation of how memories for the referendum may change or stay the same over time.

The final sample on which the analyses in this paper were conducted (*n* = 601) included only participants who completed all four surveys and who provided an answer to the questions about reasons for voting at all time points and reported having a stated preference for Yes (i.e. voted Yes [*n* = 520] or didn't vote but would have voted Yes [*n* = 22]) or No (voted No [*n* = 57] or didn't vote but would have voted No [*n* = 2]). There was no difference in the attrition rate of Yes and No voters, with No voters making up 9.2% of the initial sample (*n* = 150) and 9.8% of the final sample (*n* = 59). While specific efforts were made to recruit No voters, the vast majority of our sample reported voting Yes. This may have been due to the fact that the online recruitment method that was employed was more suited to a younger sample; exit polls showed that the only age cohort to vote No in the majority were over 65's, with 87% of 18-24 year olds voting Yes (Leahy, 2018). Importantly, voting choice was irrelevant to the research questions, which applied equally to both Yes and No voters. As there is a well-known tendency to overreport voting behaviour (Bernstein et al., 2001) and most of our sample (96%) reported voting, our analyses do not include comparisons between those who did and did not vote.

The average age was 39.39 (SD = 13.34) and participants ranged in age from 19 to 82 at the time of final survey. Participants reported their biological sex as female (*n* = 415), male (*n* = 181) or other (*n* = 0), while five participants declined to answer. A comparison of demographic and referendum-related factors for Yes and No voters can be seen in Table 1. Yes voters were, on average, younger and more likely to be female. Yes voters reported being directly affected by the 8th amendment in the past to a greater extent than No voters and also

reported expecting abortion legislation to more significantly affect them in future. At baseline, Yes voters rated the referendum as more important to them and reported consuming more referendum-related media and engaging in more referendum-related discussion since the vote than No voters, but these differences were not evident at the one-year follow up.

Procedure

The referendum took place on Friday the 25th May 2018, with the results announced on the evening of Saturday the 26th May 2018. The baseline survey was completed in the week following the referendum and participants provided an email address for follow-up. Follow-up surveys were completed three, six and twelve months post referendum with surveys distributed by email on May 30th, August 28th, December 4th 2018 and May 20th 2019. The final survey was distributed a few days early due to concerns about the potential effects of media coverage on the one-year anniversary of the referendum. A reminder was sent to all unfinished respondents at each wave, three days after the initial email, and participants had 7 days to respond.

Materials

The raw and coded data are available at https://osf.io/txu6c/. The survey at each wave took approximately 20 minutes to complete, though many questions were for other studies and only the measures relevant to the current study are described here. At all time points, participants were asked ‘How important was the referendum to you?’ answering on a scale of 1 (Extremely Important) to 9 (Not at all Important) and were then asked ‘How did you

vote in the referendum?' and could select from 'I voted Yes', 'I didn't vote but would have voted Yes', 'I voted No', 'I didn't vote but would have voted No', 'I didn't vote and wasn't leaning either way' or 'I'd prefer not to say'. Immediately after answering this, participants were asked 'What were the main reasons for your voting choice?' and provided with an open text box in which to respond. The next question was 'Were there any other reasons?' and was also answered via an open text box. This format replicates that used in Kaasa et al. (2011) and was selected in order to not limit participants' answers nor prime them in any way by providing them with a list of options to select from. Moreover, two questions were included as we wanted to give participants ample opportunity to list any and all reasons that they deemed important, both big and small. Both were phrased in the past tense ('what *were* your reasons?') as we wanted to assess participants' recall of what motivated their choice at the time, not their current beliefs.

In addition, participants were asked in every survey: 'How much have you followed media coverage of the referendum since the result was announced?' and 'How much have you talked about the result since the announcement? (i.e. discussions with family and friends)', both of which were answered on a scale of 1 (A Great Deal) to 5 (Not at All). Participants were then asked 'To what extent do you feel that the 8th Amendment has directly affected your own life in the past? (i.e. affected you or your partner's healthcare or reproductive decisions)' and 'To what extent do you feel abortion legislation might directly affect your life in future? (i.e. affect you or your partner's healthcare or reproductive decisions)' and answered using the same 1 (A Great Deal) to 5 (Not at All) scale. Participants were asked 'Did you formally campaign on either side of the referendum? (e.g. canvassing)' and could select an option from 1. Never, 2. Once or Twice, 3. Many Times. At the end of

every survey, participants were asked to rate their current feelings of pride, guilt and regret about their voting choice on a scale of 1 (Not at all) to 9 (Extremely).

At baseline, participants were also asked to complete the Wordsum cognitive ability test. The Wordsum is a 10-item vocabulary test taken from the Wechsler Adult Intelligence Scale (Wechsler, 2008). Participants are presented with a word (e.g. BEAST) and asked to select the closest match from a list of five other words (e.g. Afraid, Words, Large, Animal, Separate). The Wordsum is highly correlated with lengthier IQ tests (Miner, 1957). The majority of participants who had completed our other study one-week prior had already completed the Wordsum in that study and so they were not presented with it as part of this study; their previous scores were used. In total, 563 of the 601 participants included in this study completed this measure.

At the six-month follow up only, participants were asked 'On the whole, not just in reference to this referendum, how good do you think your memory is for events from your life? How would you rate yourself relative to the rest of the population?'. This question was answered using a 1-100% slider to fill in the blank of 'Better than __% of the population'.

At the 12-month follow-up only, participants were presented with an additional question on the survey page immediately following the open-response questions about their reasons for voting:

'Over the past year, participants in this study have told us their reasons for voting Yes or No in the referendum. We have collapsed these answers into the most common categories – please tick as many of these reasons as apply to you'

Participants were presented with the coding scheme developed by the researchers using previous responses (see below for description of the coding process). Participants could select as many of the thirty reasons as they wished. All reasons were shown to all participants (i.e. both reasons for voting Yes and No) in a list format, with the reasons presented in a randomised order for each participant.

Table 1: Demographic and referendum-related variables for Yes and No voters at baseline and at the twelve month follow-up.

	Yes Voters	No Voters	
Demographics	*M (SD)*	*M (SD)*	*Effect size*
N	542	59	
Age	36.68 (12.92)	46.05 (15.04)	*d* = 0.57
Sex	72% female	47% female	*V* = .17
Cognitive ability	8.27 (1.45)	8.23 (1.49)	
Baseline: 1 week post referendum			
Personal importance of referendum	7.93 (1.29)	7.31 (1.5)	*d* = 0.44
Followed media coverage	3.65 (1.04)	3.07 (1.26)	*d* = 0.50
Discussed referendum with friends/family	3.59 (1.01)	3.29 (1.04)	*d* = 0.29
Directly affected by amendment in the past	2.11 (1.35)	1.59 (1.10)	*d* = 0.42
Directly affected by legislation in the future	2.50 (1.36)	1.80 (1.23)	*d* = 0.53
Campaigned in the referendum	1.31 (0.67)	1.29 (0.65)	-
Final survey: 12 months post referendum			
Personal importance of referendum	7.83 (1.44)	7.46 (1.54)	-
Followed media coverage	3.08 (1.02)	3.25 (1.09)	-
Discussed referendum with friends/family	2.89 (0.99)	2.83 (1.10)	-
Directly affected by amendment in the past	1.97 (1.24)	1.48 (0.94)	*d* = 0.46
Directly affected by legislation in the future	2.39 (1.32)	1.90 (1.24)	*d* = 0.38

Note. All values are presented using scales where higher numbers indicate a greater amount (more important, more media consumption, more discussion, more directly affected, more campaigning). Effect sizes are shown for statistically significant differences ($p < .05$).

Analysis

A coding scheme was created to organise reasons for voting into 30 categories (the full scheme can be seen in Appendix A). One researcher read the first 200 baseline responses (out of a total of 1630) and created categories that reflected the answers. This was then used by a second researcher to code 200 new responses, before being further refined after discussion between the two researchers. After refining the coding scheme, the two researchers independently coded 200 new responses and achieved high inter-rater agreement (kappa = .90). When deciding what categories to collapse/retain, the key factor considered was whether the two reasons were meaningfully different as motivations for voting, be that politically, legally or emotionally. For example, the category of Choice/Bodily Autonomy was considered separate to Protection of Mother's Life/Health, as the former implies a pregnant person should be able to decide if they wish to terminate a pregnancy for any reason, whereas the latter relates specifically to concerns about protecting access to healthcare/preserving life when it is threatened by a pregnancy. Similarly, Value of Human Life was considered a distinct category to Legal Rights of the Unborn, as the former consisted of moral/emotional arguments about the ethics of abortion, whereas the latter was a legal argument specifically relating to the constitutional right to life for the unborn. The final scheme consisted of 30 categories. The coding scheme was used for two, independent types of coding ('Single-Response Coding' and 'Consistency Coding').

Single-Response Coding: All Main Reasons and Other Reasons responses were coded by two researchers independently, using the coding scheme. As each participant gave multiple reasons in each response, inter-rater agreement was calculated within coding categories

(i.e. the level of agreement between raters that a given category was present/absent in the answer). The average kappa was .97, with a minimum of .81 and a maximum of 1. All coding disagreements were resolved by a third person. This coding was also used to calculate commission errors between successive waves (e.g. where a category was not mentioned at one wave but was mentioned at the next wave) and omission errors between waves (where a category was mentioned at one wave but not at the next wave). These errors were summed to calculate a total error score, representing inconsistency across the study. This score counted each error individually, so for example, if a participant gave reason X at baseline, then didn't mention it at Wave 2, but then reported it again at Wave 3, that would amount to an inconsistency score of two (one omission error and then one commission error).

*Consistency Coding: R*esponses were again coded by two researchers independently. Coders compared two responses given by the same participant (i.e. at baseline and three months, three months and six months, etc.) and used the coding scheme described above to decide how consistent the responses were over time. As in Kaasa et al. (2011), responses were assigned one of five codes; Entirely Consistent (the exact same reasons at both waves, allowing for differences in phrasing or specificity), Some Reasons Forgotten (no new reasons added at follow-up, but one or more original reasons omitted), Some Reasons Added (no original reasons omitted but one or more new reasons added at follow-up), Some New Reasons Substituted for Old Reasons (both new reasons added and original reasons omitted), Entirely Different Reasons (no original reasons repeated). Raters coded the response from each wave as a whole and didn't differentiate between Main and Other

Reasons, so if a participant gave Reason X as a Main Reason and Reason Y as an Other Reason at baseline, but these were switched at follow-up (Reason Y as Main and Reason X as Other), this was still coded as entirely consistent. Inter-rater agreement was acceptable for all time points; Baseline: Three Months kappa = .77, Baseline: Six Months kappa = .75, Three Months: Six Months kappa = .71, Baseline: Twelve Months kappa = .83, Three Months: Twelve Months = .72, Six Months: Twelve Months kappa = .71. All coding disagreements were resolved by a third person. Examples of responses from each consistency category can be seen in Table 2.

Table 2: Examples of participant responses from each consistency category. The codes identified in each answer are shown in the left-hand column, with inconsistently mentioned codes in grey.

Category	First Response (Main (M) & Other (O) Reasons)	Second Response (Main (M) & Other (O) Reasons)
Entirely Consistent *(Choice/Bodily Autonomy, Compassion, Abortion Happening Anyway)*	M: Briefly: 1) abortion happens anyway, the 8th only makes the whole thing a bit more traumatic than it has to be for the woman 2) life is complicated - it's grand to say you don't like abortion but you can't force someone to continue a pregnancy if they don't want to (ie freedom of choice, not my business) O: (not provided)	M: Free choice, autonomy, happens anyway just abroad, it was cruel and punished vulnerable women O: (not provided)
Some Reasons Omitted *(Choice/Bodily Autonomy, Objection to the Opposing Campaign)*	M: To let woman have bodily autonomy over their choices in pregnancy, and to allow for abortions to a certain point. O: The No campaign was very underhand, so I wanted to see them lose.	M: To legalise abortion O: To allow women freedom of choice in regards to their body
Some New Reasons Added *(Distrust of Future Governments, Value of Human Life, Proposal too Liberal, Objection to the Opposing Campaign)*	M: A concern that, at some point in the future, an Irish government might legislate for a "No Questions Asked" policy that goes beyond the currently proposed 12 weeks. I believe that at some point, abortion does become murder. O: No. This was the only one.	M: I believe that at some point in pregnancy, the foetus becomes a viable baby, after which I would be entirely against abortion. I would have been happy to vote Yes (i.e. repeal) if I had been asked to vote for a, say, 12-week no-questions-asked repeal. However, as I was being asked to vote for a blanket repeal, with any future decisions around the right to terminate being decided by politicians (and not the general public), I felt that I could not support the referendum as put forward. O: I was horrified to hear "feminists" say that they had no concern for an unborn baby and were only voting "Yes" because they feel that abortion should be a woman-only issue.
Some New Reasons Substituted for Old *(Choice/Bodily Autonomy, Protection of Mother's Life/Health, Friend's Experience, Anti-Church Statement)*	M: Women's right to healthcare, choice and bodily autonomy O: Cousin who was diagnosed with cancer while pregnant and could not travel, as her husband would have divorced her. She went to term and then commenced treatment but it had spread. She died age 40.	M: Bodily Autonomy, Freedom of choice, Provision of appropriate health care to those in need of it. Separating Church and state O: No
Entirely Different Reasons (Other Reasons, Value of Human Life, Don't See the Need for a Change)	M: As an educated man I could foresee that the country isn't financial equipped to cater for the infrastructure that it needed to set up clinics. O: Also I think the government spin were using to referendum to mask the scandal of the cervical smear tests.	M: I was a yes. But after more information became available to myself I changed my mind. I believe in preservation of life O: Abortion is and was available to women before the referendum

Results

We first analysed the number of words that participants wrote at the different time points (see Table 3). Participants wrote significantly more words at baseline relative to the three month follow-up $t(601) = 7.59$, $p < .001$, $d = 0.32$, six month follow-up $t(601) = 7.01$, $p < .001$, $d = 0.28$ and twelve month follow-up $t(601) = 9.70$, $p < .001$, $d = 0.37$.

Table 3: Number of words written by participants at each wave in response to the questions 'What were the main reasons for your voting choice?' and 'Were there any other reasons?'.

	Main Reasons: Mean (SD; min - max)	Other Reasons: Mean (SD; min - max)	Total: Mean (SD; min - max)
Baseline	20.68 (23.51; 0-317)	13.38 (24.12; 0-337)	34.05 (37.85; 1-404)
Three Months	15.33 (15.93; 1-208)	8.70 (13.89; 0-123)	24.03 (24.44; 1-250)
Six Months	14.61 (22.39; 0-334)	9.28 (18.32; 0-291)	23.89 (33.79; 1-493)
Twelve Months	13.97 (20.61; 0-363)	7.82 (13.07; 0-92)	21.79 (26.75; 0-370)

1. Did the top reasons for each group (Yes & No voters) remain the same over time?

Participants were split into Yes and No voters so each group's top reasons could be examined at each wave. Preliminary analyses indicated that there was no significant difference between the number of reasons reported by Yes and No voters at baseline or any of the follow-ups (all $p > .05$). The percentage of Yes voters that reported each reason in their answers at each time point can be seen in Table 4, as well as the percentage of Yes voters that selected each reason when it was presented to them as a list twelve months after the referendum. Though there was some change in the proportion of voters reporting each reason at each time point, the top three reasons at baseline (1. Choice/Bodily Autonomy, 2. Protection of Mother's Life/Health, 3. Compassion) remained the top three reasons at the three and six month follow-ups. At twelve months, the top three reasons were only marginally different (1. Choice/Bodily Autonomy, 2. Protection of Mother's Life/Health, 3. Abortion was Happening Anyway). As can be seen in Table 4 (arranged in descending order of frequency of reason at baseline), this overall high level of ranking consistency is evident across the entire analysis, beyond the top three. There are some changes across follow-ups, with reasons becoming slightly more or less common, but generally, the relative frequency of each reason does not dramatically change.

The more substantial change was between the reasons given by participants in the free-response question at twelve months and the reasons selected from the list just moments later. As expected, participants selected significantly more reasons from the list than they had reported in response to the free response questions. The top three reasons from the twelve-month list are 1. Compassion, 2. Choice/Bodily Autonomy, 3. Abortion was Happening Anyway, and so are not very different from the top reasons reported for earlier

free-response questions. Of note though are the dramatic and unevenly distributed increases in selection of reasons. For example, just 8% of participants mentioned Compassion as a reason for their voting choice at twelve months (this included mentions of caring for women, looking after them, not making a difficult time worse, etc.), but when presented with a list, this was selected by 90% of participants as a reason for their vote.

Table 4: Reasons reported by Yes voters (*n* = 542) in reply to a free-response question at baseline, three months, six months and twelve months, as well as selected by the same voters from a list at twelve months. The average number of reasons given by Yes voters at each time point is also shown.

	Baseline	Three Months	Six Months	Twelve Months	Twelve Months List
Choice/Bodily autonomy	74%	82%	81%	85%	87%
Protection of mother's life/health	26%	25%	29%	21%	75%
Compassion	18%	13%	14%	8%	90%
Abortions are happening anyway	11%	8%	10%	9%	84%
'Hard cases' (rape, fatal fetal abnormality, etc.)	11%	8%	11%	8%	62%
Hearing personal stories	10%	3%	4%	4%	65%
Doesn't belong in the constitution	8%	7%	5%	6%	48%
Modernizing Ireland	7%	6%	8%	4%	49%
Friend's experience	7%	4%	5%	5%	36%
Anti-church statement	7%	9%	7%	6%	14%
Personal experience	6%	5%	4%	6%	21%
Fetus not equivalent to mother's life	5%	3%	2%	1%	50%
Objection to opposing campaign	2%	1%	1%	1%	16%
Moral reasons (unspecified)	1%	3%	2%	2%	32%
Professional experience	1%	1%	2%	1%	9%
Scientific reasons	<1%	<1%	<1%	<1%	10%
Average number of reasons given (SD)	1.93 (0.98)	1.77 (0.86)	1.86 (0.96)	1.68 (0.86)	7.68 (2.79)

No voters (i.e., those who opposed repealing abortion restrictions) also reported relatively consistent top reasons over time (see Table 5) though as previously noted, the sample of No voters was much smaller. The top three reasons given at baseline (1. Value of Human Life, 2. Legal Rights of the Unborn, 3. Proposed Legislation was too Liberal) are identical to the top three reasons given three months later. At six months, there is a slight change to the top three reasons (1. Value of Human Life, 2. Legal Rights of the Unborn, 3. Repeal Would Increase 'Unnecessary' Abortions') and this change is sustained at 12 months.

When presented with the list at 12 months, the top three reasons stayed the same but there was a shift in order (1. Repeal Would Increase 'Unnecessary' Abortions', 2. Value of Human Life, 3. Legal Rights of the Unborn). Again, presenting participants with a list of reasons increased the number of participants who claimed each reason, but the increase was not evenly distributed across all reasons. For example, the notion that abortion is discriminatory (on the basis of gender, disability, etc.) was mentioned by 2% of participants in the free response question at twelve months, but was then selected by 42% as one of their reasons just moments later.

Table 5: Reasons reported by No voters (*n* = 59) in reply to a free-response question at baseline, three months, six months and twelve months, as well as selected by the same voters from a list at twelve months. The average number of reasons given by No voters at each time point is also shown.

	Baseline	Three Months	Six Months	Twelve Months	Twelve Months List
Value of human life	37%	48%	58%	40%	77%
Legal rights of the unborn	33%	37%	32%	32%	73%
Proposed legislation too liberal	20%	15%	8%	8%	63%
Repeal would Increase 'unnecessary' abortions	18%	13%	13%	15%	80%
Distrust of future governments	18%	10%	10%	13%	53%
Alternatives to abortion are available	8%	7%	5%	5%	68%
Moral reasons (unspecified)	5%	7%	10%	10%	72%
Objection to opposing campaign	5%	5%	7%	3%	18%
Professional experience	5%	3%	3%	2%	5%
Friends' experience	2%	0%	8%	5%	18%
Abortion is discriminatory (disability, gender)	3%	0%	3%	2%	42%
Religion	3%	3%	2%	3%	22%
Cultural reasons (preserving Irish society, etc.)	3%	2%	2%	2%	8%
Abortion harms women	2%	8%	8%	3%	38%
Don't see a need for change	2%	2%	0%	3%	48%
Personal experience	2%	5%	5%	5%	27%
Violence/cruelty of abortion	0%	0%	0%	2%	60%
Average number of reasons given (SD)	1.68 (0.85)	1.68 (1)	1.78 (0.98)	1.53 (0.91)	8.50 (4.04)

2. Did reasons given by an individual voter at baseline remain consistent across follow-ups?

As shown in Table 6, we calculated the total commission and omission errors made between each wave (i.e. from baseline to the first follow-up, from second follow-up to third follow-up, and from third follow-up to the final wave). The average total number of errors across the entire study was 4.22, though the range spanned from 0-15. The total errors from wave 1 to 2 were greater than those from wave 2-3, $t(601) = 4.64$, $p < .001$, $d = 0.19$ and from wave 3-4, $t(601) = 4.98$, $p < .001$, $d = 0.20$. The total errors from wave 2-3 did not differ from wave 3-4, $t(601) = 0.34$, $p = .737$. Errors made between baseline and the first follow-up were only weakly correlated with the summed errors made between subsequent waves, suggesting that initial consistency was not a strong predictor of subsequent consistency; omission errors ($rs = .19$. $p < .001$), commission errors ($rs = .27$. $p < .001$), total errors ($rs = .39$. $p < .001$).

Table 6: Average omission and commission errors recorded between each wave of the study.

	Omission Errors (SD)	Commission Errors (SD)	Total Errors (SD)
Waves 1-2	0.92 (0.85)	0.73 (0.83)	1.64 (1.30)
Waves 2-3	0.60 (0.76)	0.70 (0.85)	1.30 (1.25)
Waves 3-4	0.75 (0.83)	0.53 (0.75)	1.28 (1.20)
Total	2.26 (1.43)	1.96 (1.40)	4.22 (2.44)

In examining the consistency of responses across the study, relative to baseline, fewer than 30% of all follow-up responses were entirely consistent with the response given at baseline. Just 11% of participants gave an answer consistent with their baseline response at every one of the three follow-ups, while 4% of participants gave a response that was entirely *inconsistent* with their baseline answer at every follow-up. As shown in Figure 1, most participants demonstrated some errors but at least partial consistency. Furthermore, Figure 1 also illustrates that levels of inconsistency with baseline did not meaningfully change in later follow-ups, with participants equally likely to give a response consistent with baseline at three, six and 12 months post-referendum.

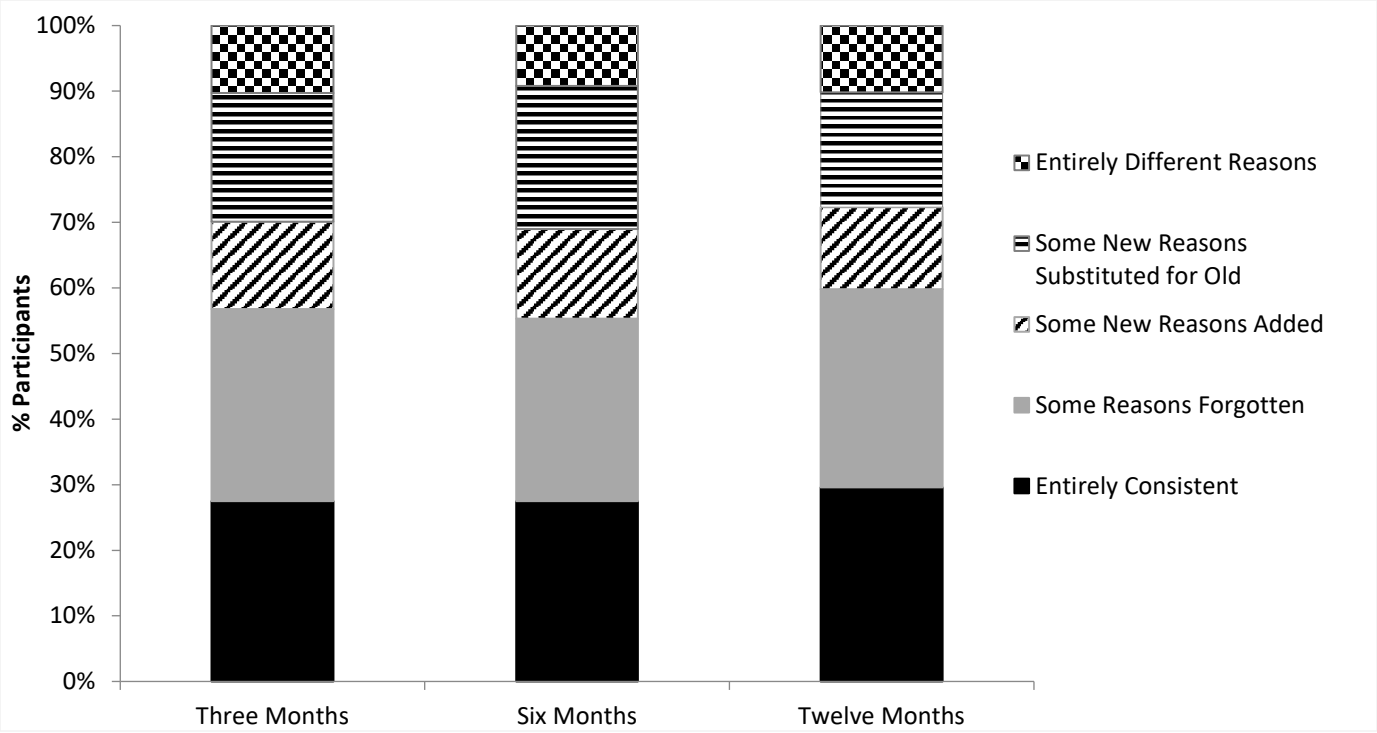


Figure 1: Consistency of participants' responses (relative to their baseline answer) at three months, six months and twelve months post-referendum.

We further assessed consistency between waves (see Figure 2). Using the same coding scheme, we coded the consistency of responses between three and six months, between three and twelve months, and between six and twelve months (thus assessing consistency, not with baseline as we did above, but with other stages of the study). As can be seen in Figure 2 and echoing our analysis of commission and omission errors, the rate of change slowed slightly after the first three months post-referendum.

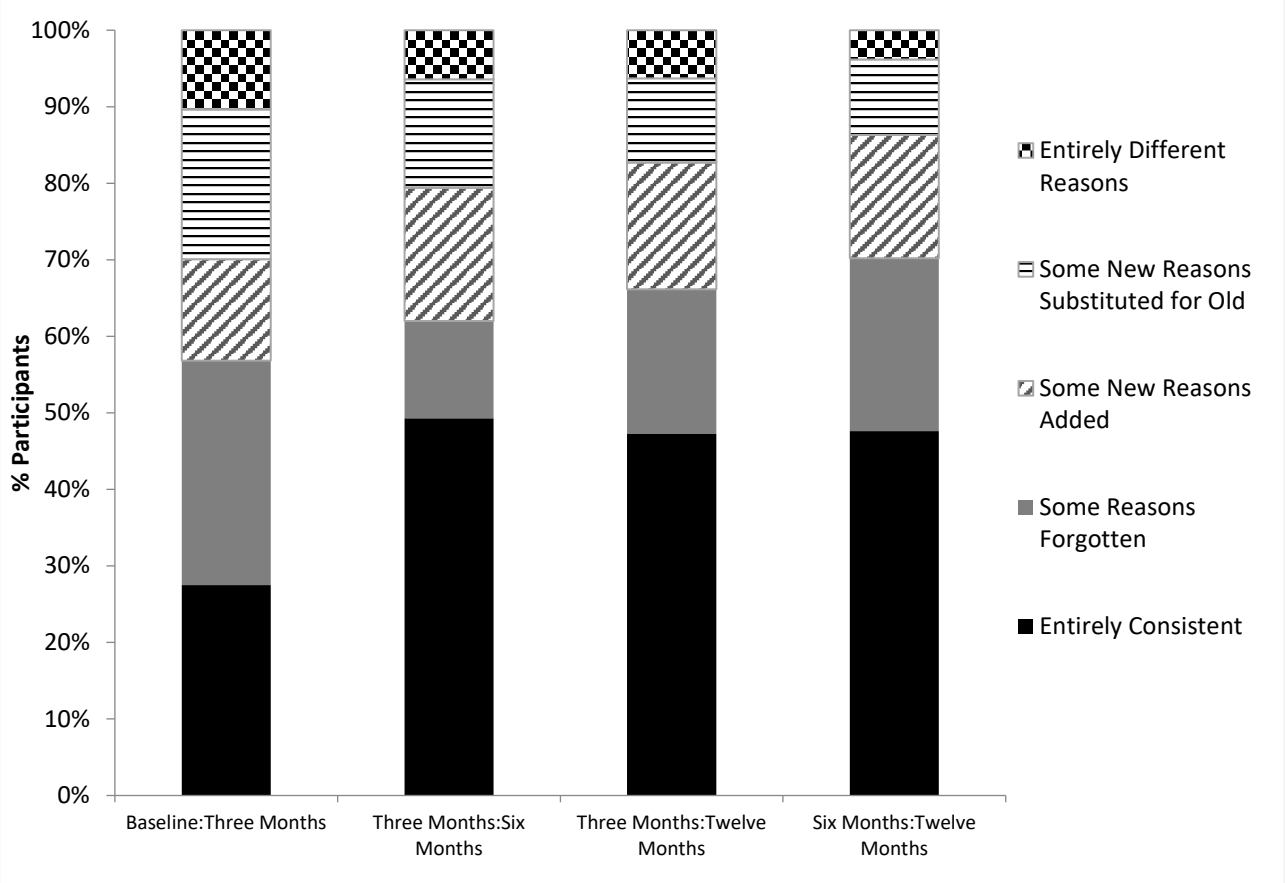


Figure 2: Consistency of participants' responses (relative to a prior answer) at three, six or twelve months post-referendum.

3. Do individual differences predict consistency over time?

To assess whether individual consistency is associated with referendum engagement and demographic factors, a multiple linear regression was conducted with total errors across the study period as the dependent variable. There were no multicollinearity concerns; for all predictors, VIF < 2 and tolerance > .5, with all predictors correlated at $r < .61$. The regression equation was not significant, $F(9, 541) = 1.61$, $p = .110$, $R^2 = .03$. As shown in Table 7, errors were more numerous for older participants and there was also a significant effect of cognitive ability, with fewer errors for those who scored higher on the Wordsum test. There were no significant effects of any of the referendum-related variables. The results remained broadly the same if the regressions were conducted separately for omissions and commission errors; for omissions age and cognitive ability were significant predictors, while for commissions age was not significant ($p = .09$), leaving cognitive ability as the only significant predictor.

Table 7: Results from a linear regression with total errors (omission + commission) from the entire study as the dependent variable (*n* = 551). Some referendum-related variables were recorded at multiple waves, so the measurement wave is indicated below.

	B	SE B	β	t	*p*
Age	-0.01	0.01	-.10	-1.69	**.036**
Cognitive Ability	0.28	0.09	0.14	3.07	**.002**
Personal Importance of the Referendum (baseline)	0.18	0.11	0.08	1.73	.085
Past Directly Affected by Amendment (baseline)	0.02	0.10	0.01	0.15	.880
Future Directly Affected by Amendment (baseline)	-0.14	0.12	-0.07	-1.20	.231
Referendum Media Consumption (baseline)	-0.02	0.16	-0.01	-0.13	.901
Referendum Media Consumption (final wave)	0.07	0.16	0.02	0.43	.671
Referendum Discussions (baseline)	-0.35	0.17	-0.01	-0.21	.837
Referendum Discussions (final wave)	-0.07	0.16	-0.02	-0.43	.667

4. Did response format affect consistency?

Though we have labelled one of our categories 'Some Reasons Forgotten', it is difficult to be certain that participants have truly *forgotten* their reasons. It is obviously effortful to fill out a text box in response to a question. Thus, if someone neglects to write out a reason, we cannot know if they truly don't recall that as part of their voting motivation or if they do remember it, but don't go to the trouble of writing it out, or indeed, if they have temporarily forgotten to list it. However, if lack of effort or temporary forgetting is the only obstacle to participants listing a reason (rather than true memory change) then we

would expect to eliminate this 'forgetting' if participants are provided with a prompt and we reduce the effort required to select a reason.

To investigate this and to assess consistency across different measurement methods, we analysed those who gave each reason at baseline (in the open text response format) and assessed how many of them went on to select that reason from the list they were presented with during the twelve-month follow-up. Our findings suggest that while participants were likely to select reasons they had previously described (see Table 8), a sizeable minority did not select a reason from the list that they had given in text at baseline. Of the 1147 reasons mentioned at baseline, 196 (17%) were not selected from the list at one-year follow-up.

For example, of the 36 people who described making an anti-church statement at baseline, just 13 of them selected it from a list at twelve-month follow-up (36%). Many of those who failed to later select the category had written long and detailed answers identifying anti-church sentiment as a primary motivation for their vote at baseline. A 20-year-old Yes voter reported in their answer at baseline that *'The existence of the amendment was a sign of the church's power over the state. I wanted to remove some of this power in the hopes of making Ireland more secular'* but did not select Anti-Church Statement from the list at twelve months (selecting two other reasons instead). Likewise, a 54-year-old participant reported their main reason for voting Yes at baseline as *'To give women a choice'* but did not select Choice/Bodily Autonomy from the list at twelve months (selecting five other reasons instead).

Table 8: The number of participants that described each reason at baseline (using the free response text box format) and the percentage of those participants who failed to select that same reason from the list provided at the twelve-month follow-up.

	n reported reason at baseline	% of those who failed to select this reason at one-year follow-up
Choice/bodily autonomy	400	10%
Protection of the mother's life or health/access to healthcare	141	20%
Compassion for women, caring/looking after/trusting women	98	4%
Abortion was happening anyway/just exporting the problem	60	10%
'Hard cases' including rape, incest, fatal foetal abnormalities	58	21%
Hearing/reading people's personal stories	54	15%
Issue doesn't belong in the constitution/legal problems	43	23%
Friends' experience	37	22%
Modernising Ireland/Irish law	36	39%
Making an anti-church statement	36	64%
Personal experience	34	15%
Foetus not legally or morally equivalent to a mother's life	27	15%
Value of human life, life begins at conception, etc.	22	18%
Legal right to life for unborn	20	15%
Objection to the opposing campaign	15	53%
The proposed legislation was too liberal	12	25%
Distrust of government/concern about future legislation	12	25%
‘Social abortions’/Increase in abortion rates	11	18%
Professional experience	10	20%

Note. Categories mentioned by fewer than 10 participants are not included here.

Discussion

The current study is the first to assess the consistency of voters' recollections of why they voted as they did. We first assessed consistency at the aggregate level, finding that the top reasons provided by Yes and No voters were largely consistent over time. However, the top reasons may have remained consistent only because they were substantially more common than all other reasons for both Yes and No voters, i.e. so far out in front that even with some change in responses, they remained the top answers. It is possible that, in political contexts with a wider range of frequent reasons, even the top reasons may not be consistent over time.

Our second question concerned individual consistency. We found that while most participants (83%) showed at least partial consistency, where at each follow-up they reported at least one reason that they had mentioned at baseline (though not necessarily the same reason each time). However, just 11% of participants gave an entirely consistent response from baseline through each of the follow-up surveys. The rate of change slowed slightly after the first three months, but there was no evidence of a steep forgetting curve. The rate of inconsistency was similar to that observed by Kaasa et al. (2011) in a study assessing memories for a CD purchase. A sizeable minority of participants described a reason at baseline and then failed to select that reason from the list at the 12-month follow-up, suggesting these reasons truly were forgotten. A potential limitation here is a mismatch between our coding scheme labels and how participants might describe their reasons, but we don't believe that to be the case for the majority of responses as they so clearly fit within a given category.

We also examined whether a change in measurement, from recall to recognition, would affect the top reasons given at the twelve-month follow-up. This resulted in a more substantial change of the top reasons. It may be that participants did not truly hold these reasons but found them plausible when presented with them, or it may be that they held these reasons all along but did not mention them previously. The latter may suggest that presenting respondents with a list might artificially inflate weight given to these issues. As an example, of the 261 participants that selected 'The issue doesn't belong in the constitution' from the list, 195 (75%) had failed to mention this in any of the four surveys. This finding underscores the importance of selecting appropriate methods for surveys of voter recall.

Unlike flashbulb memory studies that have found media consumption, discussions with friends and family, and personal relevance to be important predictors of event memory accuracy and flashbulb memory consistency (Hirst & Phelps, 2016), we found no evidence that referendum engagement affected consistency. Errors were more likely for older participants and less likely for those with higher verbal cognitive ability, similar to other studies of memory errors (Gaesser et al., 2011; Murphy et al., 2019). We also found no evidence that top reasons varied in line with current events. For example, abortion services became available between the six and twelve month follow-up and despite media coverage of a potential increase in abortion rates, 'increase in "unnecessary" abortions' did not become a more common reason. Furthermore, the three-month follow-up survey was distributed just two days after Pope Francis visited Ireland, an event that prompted public discussion of the role of the church in modern Ireland (O'Toole, 2018). However, there was no significant increase in mentions of Religion by No voters (3% at baseline, 3% at three months, 2% at six months) or reports of Making an Anti-Church Statement by Yes voters (7%

at baseline, 9% at three months, 7% at six months). We therefore have no specific evidence to support the role of on-going national events in distorting voters' recollections.

In understanding the potential mechanisms behind the inconsistencies observed in the current study, we have no evidence to support a role for media consumption or personal relevance, as observed in flashbulb memory studies. Altering the response format, from free recall to a list format did significantly affect responses, perhaps suggesting that memory for prior motivations may be partially reconstructed in the moment. Future research might measure current motivations as well as memory for motivations at the time of voting. We might predict that the greater the mismatch between attitudes at baseline and attitudes at follow-up, the less consistent memories of baseline motivations are likely to be, as in previous studies of memory for emotions (Levine et al., 2001).

While the current study concerned memories for voting in an abortion referendum, it is unclear how similar the findings would be for a different political decision, e.g. a general election. Voter decisions tend to be less volatile in referendums concerning ideology and where the issue presented is a familiar one (LeDuc, 2002). In an Irish abortion referendum exit poll, just 12% of participants said they had made their mind up during the campaign, while 75% stated that they had always known how they would vote (McShane, 2018). While these responses may be skewed by hindsight bias (Roese & Vohs, 2012), voters may have difficulty in recalling reasons for a choice that they 'have always known'. In contrast, in a 2016 US Presidential election exit poll, 40% of voters reported deciding between Trump & Clinton between September and polling day in November (CNN, 2016). In such a situation, the memory for voting motivation may be more recent and therefore more accurate, but equally, general elections concern a broader range of issues and memory could be less accurate. This is certainly a question worthy of further research.

The current study has implications for the media and for political strategizing. For example, pro-choice activists in other countries may look to voter reports of what worked in Ireland when deciding where to direct their efforts and funds, but these reports may not be reliable. The inconsistency observed in the current study also raises questions about the reliability of self-report measures in other applied settings. For example, the same issues may apply to investigations that ask women why they left STEM degrees or ask customers what made them choose their product, with inconsistencies likely to appear across multiple follow-ups. As highlighted by Kaasa et al. (2011), many legal cases also require individuals to explain the reasons for their behaviour. Our findings suggest that witnesses' recollected motivations should be treated with caution and the format of questions (open-ended vs. closed) has an important impact.

Our study adds to the literature that questions the fundamental validity of explanations of past behaviour. Previous work has suggested that individuals have a poor understanding of factors that influence their behaviour (Nisbett & Wilson, 1997) and can, apparently unknowingly, generate introspective reports of motivations for choices they never made (Johansson et al., 2005). Future work should further assess the reliability and validity of reported motivations and how they may be contaminated by post-event information or changes in attitudes.

Author Contributions

G.M. developed the study concept and all authors contributed to the study design. G.M. collected the data. G.M., C.M.G. and R.H.G. developed the coding scheme and G.M. and C.M.G. oversaw data coding. G.M. analyzed the data and drafted the manuscript. All authors provided critical revisions and approved the final manuscript for submission.

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Appendix A: Coding Scheme

0. Not stated, uninterpretable

Moral/ethical reasons

1. **Choice/bodily autonomy** for women (including right to grant or withhold consent for medical procedures). Also includes 'none of my business'/'can't foist my choice on others' as well as comments relating to respecting or trusting women.
2. **Compassion** towards women; emotional reasons relating to women in crisis, crisis pregnancy, tragic circumstances, empathy, looking after our own women.
3. **Religious reasons**: Life is sacred, abortion is counter to church teachings [specific mention of religion needed – Christian, God, Bible, Church, 'Thou Shalt Not Kill' etc.]
4. Disagree with '**social abortions'** (performed for social/economic/convenience reasons) or abortion as contraception. Culture of abortion/normalization of abortion. Repeal will result in increased number of abortions.
5. Concerns about **violence or cruelty of abortion** – causing pain etc.
6. Emotional responses relating to **importance/value of human life**: life begins at conception; babies are precious; killing/murder is always wrong; giving a voice to the voiceless, saving lives (of unborn).
7. **Abortion is discriminatory** (on the basis of sex, race, social class, disability etc.). Including mention of designer babies, selective abortion etc.
8. Abortion causes **physical/emotional/psychological harm to women.**
9. **Moral reasons** (unspecified)

Scientific reasons

10. **Scientific reasons** regarding beginning of life (e.g. distinction between embryo and foetus)

Legal reasons

11. This issue **doesn't belong in the constitution/**legal problems with the amendment
12. Concerns about **future changes to legislation/distrust of government**
13. **Foetus not legally or morally equivalent to mother's life**; e.g. balance of rights, or woman's value outweighs that of foetus.
14. Specific references to **rights of the unborn**: fundamental right to life, legal protection for the unborn, human rights starting at conception.
15. **Proposed legislation goes too far/**would have accepted a less liberal regime: 12 week limit too extreme; disagree with abortion on demand (up to 12 weeks with no reason) or would have accepted exceptions for hard cases; objection to late-term abortions in special circumstances.

Practical/pragmatic reasons

16. **'Hard cases'** – including rape, fatal foetal abnormalities ('defects'), incest
17. **Protection of mother's life or health**; access to appropriate healthcare during pregnancy. Any mention of healthcare/empowering or trusting doctors.
18. **Happening anyway:** Irish women already accessing abortions in other jurisdictions or online/women travelling for abortions/'exporting our problems'
19. **Availability of alternatives to abortion** – adoption, better support for childrearing. Abortion is not needed/not the only answer/never the best solution to crisis pregnancy.
20. **Don't see the need for a change** – safe country to give birth, already have Protection of Life During Pregnancy Act, etc.
21. Objection to or concerns regarding the tactics or funding of the **opposing campaign**.

Personal experience

22. **Personal experience** (e.g. of pregnancy, abortion, miscarriage, rape, adoption)
23. **Friend's experience** with pregnancy/abortion/miscarriage/rape/adoption (someone known personally to the respondent)
24. **Professional experience** of pregnancy/abortion/miscarriage/rape/adoption (midwife, neonatal nurse, rape crisis counsellor etc.)
25. **Hearing/reading personal stories** ('in her shoes' etc.). Includes references to Savita Halapannavar.

Cultural reasons

26. **Cultural reasons:** Irish beliefs differing from European or British views, resisting changes to Irish society, preserving Irish culture, saving the future of Ireland.
27. **Modernisation**: the law is archaic, get with the times, coming into line with Europe, Ireland's reputation, meeting modern standards for human rights.
28. **Making an anti-church statement:** wanting to reduce or eliminate the role of the church in Ireland.

29. Lots of reasons (not enumerated)
30. Other [Please specify]