Improved wellbeing or distress? Measuring the impacts of participation in a COVID-19 survey on participant wellbeing

ANU Centre for Social Research and Methods

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Abstract

Given the large social impacts that COVID-19 is currently having on individuals throughout the world, a large amount of social and behavioural research is underway to measure and track those effects. Indeed, there has already been an explosion of new research and data collection. Any kind of social research, whether through quantitative or qualitative methods, has the potential to cause distress and impact on participant wellbeing. While previous literature has illustrated the extent to which research participation can impact distress and wellbeing in a number of contexts, no study that we are aware of has yet examined this in the COVID-19 context. This study attempts to partially fill this gap by undertaking analysis of the impacts of participation in a COVID-19 survey on distress and wellbeing. By using self-reported measures, and through the use of a survey experiment, we find little self-reported distress, and weak evidence of improvements in wellbeing through survey participation. Certain population groups, such as those with mental health concerns and those living in financial insecurity did report greater levels of distress, and worsened wellbeing through completion of the survey. These findings provide the research community (including human research ethics committees) with a deeper understanding of the potential wellbeing impacts of COVID-19-related research participation.

Acknowledgements

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1   Introduction and overview

Given the enormous health, social and economic impacts of the COVID-19 pandemic, a large number of research studies are being, and will be, conducted in Australia and throughout the world to measure the effect of the crisis on people's lives. Such research is vital to better understand the consequences of the pandemic, and how policies can be adapted to support individuals through the crisis.

Conducting research in such a potentially traumatic time, however, needs to be balanced with ethical considerations that help protect participants from any harm or distress resulting from the study. For many throughout the world, the COVID-19 pandemic has resulted in drastic changes to life and social circumstances through health concerns related to the fear of infection with coronavirus, the negative impact of physical distancing measures and economic upheaval. For these reasons, COVID-19-related research has the potential to cause distress and anxiety for participants.

There are competing responses to such a challenge. One would be to keep expanding the range and type of surveys being undertaken assuming that the benefits of the surveys outweigh the costs. That is, to privilege the policy and research needs of the moment and emphasise the benefits over the risks of the research. The other extreme would be to not collect data during such a stressful time, thereby minimising the potential risks to participants. A middle-path, however, would be to recognise the urgent need for new robust data collection, but to monitor the wellbeing of participants in a much more careful and targeted way than is done during more normal times. This study seeks to follow such an approach, and assess the impacts on participants from a COVID-19-related survey, directly measuring survey distress and satisfaction with the survey using observational and experimental methods.

A number of studies have previously examined the negative and positive impacts of research participation (e.g. Gibbs et al., 2018; A. F. Jorm et al., 1994; Lambert, Banford Witting, Ponnamperuma, & Wickrama, 2017; Newman, Willard, Sinclair, & Kaloupek, 2001; Sikweyiya & Jewkes, 2012). A vast majority of these previous studies examining the impact of participation on distress were conducting research on trauma through experiences such as bushfires (Gibbs et al., 2018), natural disasters and violence (Lambert et al., 2017), and domestic violence (Johnson & Benight, 2003; Sikweyiya & Jewkes, 2012). Studies have also examined the impact of mental health surveys on distress (Henderson & Jorm, 1990; Jacomb et al., 1999; Anthony F. Jorm, Kelly, & Morgan, 2007). The impacts of the research on participants were generally measured through self-reports following participation.

Generally, previous research has found low levels of distress, and high levels of satisfaction amongst participants following research participation (Gibbs et al., 2018; Jacomb et al., 1999; A. F. Jorm et al., 1994; Anthony F. Jorm et al., 2007; Newman et al., 2001). The evidence also suggests that higher levels of distress are likely to be observed for studies focussing on the experience of trauma (Lambert et al., 2017; Sikweyiya & Jewkes, 2012).

While this is true when averaged across entire samples, the literature suggests that individuals with particular characteristics may be more prone to experiencing distress following research participation, including those with existing mental health concerns, women, younger people, those who report financial problems, people who have experienced trauma or other adverse experiences, individuals high in neuroticism, and those with fewer social supports. It should be noted that studies have largely measured the short-term impacts of research participation,

and that there is a large research gap on medium to long-term impacts (Anthony F. Jorm et al., 2007)

A large number of studies note that despite some participants reporting that they have experienced distress, those same participants often also report high satisfaction with participating in the study. For example, a study by Lambert et al. (2017) on trauma-affected Tamil women in Eastern Sri Lanka found that 66% of participants reported distress from participation, but overall 91% reported that they had gained something positive from the study. Just over one-quarter of participants indicated that participation in the study was more distressing than they had anticipated, but 89% reported that they still would have participated even had they known in advance what participating in the study would have been like. Furthermore, a systematic review of participant distress in psychiatric research by Anthony F. Jorm et al. (2007) concluded that the experience of positive reactions from mental health-related studies are largely independent from negative reactions. Anthony F. Jorm et al. (2007) also note a lack of causal evidence in relation to measuring the impacts of research participation.

To help fill the gap in the available literature, particularly related to participant wellbeing and COVID-19, this study will also conduct a question-order experiment to measure the impact of the survey on subjective wellbeing. Participants have been randomised to one of two groups, with a subjective wellbeing scale randomly allocated either towards the beginning of the survey, or at the end. The two groups can then be compared to assess any differences in reporting of subjective wellbeing. This experiment has been pre-registered on the Open Science Foundation portal (Sollis, Biddle et al., 2020).

Scales on subjective wellbeing are well-known to be prone to question-order effects (Lee, McClain, Webster, & Han, 2016; McClendon & O'Brien, 1988; OECD, 2013; Willits & Saltiel, 1995). Given their sensitivity, this can make them a valuable tool to measure the impact of the survey on subjective wellbeing. To the authors' best knowledge, this is the first study to measure the impact of research participation on subjective wellbeing through a survey experiment, and certainly the first such experiment during the COVID-19 pandemic.

Research on COVID-19 is likely to dominate the social sciences landscape for years to come. While a number of research studies have demonstrated that the impacts of research participation are largely positive, this is the first study to examine the influence of participation in COVID-19-related research. This study will help to inform the research community on the positive and negative impacts of participating in COVID-19-related research, allowing researchers to better understand the overall impact, and which population groups are more likely to be affected. More broadly it will provide the first causal estimates of the impacts of research participation on levels of distress and benefits of research participation.

2 Methods

2.1 Data

The data from this study are taken from the 33rd wave of the ANUpoll which collected information from 3,155 Australians over the period 14-27 April 2020. It is the first longitudinal survey data on the impact of COVID-19 in Australia with respondents to the April ANUpoll also interviewed in January and February 2020. The initial analysis of the April ANUpoll data was released by the ANU Centre for Social Research and Methods on the 9th May (Biddle et al., 2020). A key initial point is the very high response rate to the survey amongst panel members

(recruited prior to COVID-19), itself an indication of willingness to engage in survey research. Specifically, a total of 3,950 active panel members were invited to take part in the survey, of which 3,155 responded, leading to a completion rate of 79.9 per cent for the survey.

By way of comparison, in January 2020 (albeit during a time of disruption in some areas due to the summer bushfires), a total of 4,009 active panel members were invited to take part in the survey, leading to a completion rate of 81.0 per cent for the survey. Given response rates tend to decline through time with online panels (Watson & Wooden, 2009; Couper 2017), the ongoing high response rates on Life in Australia™ during COVID-19 is an initial indication of commitment of respondents to keep providing information as part of the survey process.

Other questions asked on the survey (some of which are used in this paper) are social distancing behaviour, employment, income, psychological distress (via the Kessler-6 screening measure), financial stress, and housing. More detail on the survey is available in Appendix 1.

2.2   Measuring distress and satisfaction from research participation

Two measures for distress and satisfaction were used to assess the survey experience for participants. These were placed at the end of the survey, and replicated questions used in a study by Gibbs et al. (2018) to measure the impacts of bushfires in Victoria. They were:

(1) "How distressing did you find this survey?"
(2) "We are interested to know whether you are glad that you participated in this survey?".

Responses were on an 11-point Likert scale from 0 to 10, where 0 is "not at all", and 10 is "extremely". Descriptive statistics were produced for the whole sample, to better understand the level of distress and satisfaction experienced from the survey. Regression analysis was then conducted to determine whether individuals with certain characteristics were more likely to report high levels of distress or satisfaction. Sub-group analyses were then conducted for those who reported mental health concerns, those who reported COVID-19-specific mental health concerns, and those who have been personally affected by COVID-19.

2.3   Subjective wellbeing experiment

The measure used to assess subjective wellbeing was a commonly-used life satisfaction scale which asks the question "Overall, how satisfied are you with life as a whole these days?". Respondents can answer on a scale from 0 to 10, 0 being "not at all satisfied", and 10 being "completely satisfied".

A fully randomised treatment was applied at the individual level for the placement of this question. For 80 per cent of respondents, it appeared as the 3rd question in the survey after a general question on satisfaction with the direction of the country and who the person would vote for if a Federal election was held that day. For the other 20 per cent of the sample the life satisfaction question appeared as the 3rd last question, immediately prior to questions on the survey experience (discussed above). Given the randomisation process, any differences in reported life satisfaction observed between the two groups can be attributed to the process of completing the preceding questions.

The analysis firstly comprised a logit model on demographic information to test that the distribution of characteristics between the two experimental groups was not statistically different. A Wilcoxon rank-sum test was then conducted to test for differences in the distribution of responses in the whole sample to the life satisfaction question, by question-order grouping. Sub-group analyses were then conducted by demographic information, those who reported mental health concerns, those who have been personally affected by COVID-19,

those who reported distress from the survey, and those who were not glad to have participated in the survey[1].
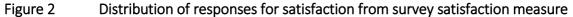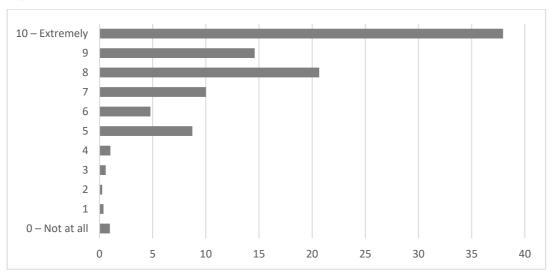
3   Results

3.1   Survey experience measures

At the population level, respondents reported relatively low levels of distress and relatively high levels of satisfaction from the survey, as shown in Figure 1 and Figure 2. There was a negative correlation between the two measures of -0.1652, which was statistically significant from 0 at the 1% level.

Figure 1   Distribution of responses for survey distress measure

Figure 2   Distribution of responses for satisfaction from survey satisfaction measure

The two scales were transformed into binary measures, where a score of 0-5 on the distress scale signified no distress, while 6-10 signified high distress. Similarly, 5-10 on the satisfaction signified the participant was glad to have participated, while 0-4 indicated not being glad to

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[1] See Biddle et al. (2020) for more details on these measures

have participated. The cross-tabulation of these binary measures is shown in Table 1, illustrating that around 6.0 per cent of participants reported experiencing distress from the survey, and 3.2 per cent reporting that they were not glad to have participated. Interestingly, those who found the survey distressing were still largely glad to have participated, with only 0.2 per cent reporting that they were both distressed and not glad to have participated in the study.

Table 1   Cross-tabulation of distress and participation satisfaction measures

	Not glad	Glad	Total
Not distressed	3.0%	91.0%	94.0%
Distressed	0.2%	5.8%	6.0%
Total	3.2%	96.8%	100%

Using a logit model with the binary measure of distress as the dependent variable, there were some differences in survey experience by demographic, socioeconomic, and geographic characteristics. Those aged 25-34 years reported higher levels of distress than the base case (aged 35 to 44 years) at the 5 per cent level of significance, as did those born in a non-English speaking country (significant at the 1% level), those who spoke a language other than English at home (significant at the 10% level), and those who lived in a capital city (at the 1% level) Those with higher levels of household income were significantly less likely to experience stress at the 5% significance level. For the satisfaction measure, there were fewer variables that were statistically significant, with a significant positive relationship observed only for household income. Where continuous measures of distress and satisfaction were modelled using an ordered logit model, there were some slight differences in results, as illustrated in Table 4 in Appendix 2.

A logit regression, using the binary measure for distress and satisfaction showed that measures of financial insecurity, financial stress, and probable serious mental illness significantly increased the likelihood that a person reported distress from the survey. These are similar findings to those from previous studies which found that those with mental illness and who are financially insecure are more likely to report distress from research participation. When using a continuous measure with an ordered logit model, individuals who were food insecure, had personal experience of COVID-19 (through either being tested or having a close contact diagnosed with COVID-19), or who were personally concerned about COVID-19 were also significantly more likely to report greater levels of distress. This illustrates that these characteristics do result in less substantial, but still significant, impacts on survey distress. Those who reported finding it very difficult on present income, and were not food insecure had significantly higher levels of survey satisfaction. A summary of these results are shown in Table 5 in Appendix 2.

These findings highlight that overall, the level of distress from participation in this survey was relatively low, and satisfaction relatively high. The vast majority of those who reported distress were still glad to have participated. While higher distress was reported by those living in financial insecurity and those with probable mental illness, this is consistent with previous research, illustrating that it is likely these population groups experience greater distress from research participation generally. Greater distress from survey participation was not observed for those more directly impacted by COVID-19, suggesting that surveys such as this one which examine the social impacts of COVID-19 are unlikely to induce distress.

4   Subjective wellbeing experiment

Remembering that around one-in-five respondents were randomly assigned to answer the life satisfaction question at the end of the survey (the treatment group) and the remainder of the sample answered at the start (the control group), it is important to test initially that there were no chance differences in observed characteristics between the two groups that may have biased the results. To do this, we estimated a logit model with treatment status as the dependent variable, testing the balance of social-economic variables between the two groups. As shown in Table 2, the randomisation process was successful in ensuring there was no significant differences between the two groups in the distribution of social-economic characteristics.

Table 2   Logit model on experimental group by socio-economic variables

	Coeff.	Signif.
Female	0.105	
Aged 18 to 24 years	0.178	
Aged 25 to 34 years	0.260	
Aged 45 to 54 years	0.105	
Aged 55 to 64 years	0.206	
Aged 65 to 74 years	0.363	
Aged 75 years plus	0.343	
Indigenous	-0.180	
Born overseas in a main English speaking country	0.027	
Born overseas in a non-English speaking country	0.168	
Speaks a language other than English at home	-0.016	
Has not completed Year 12 or post-school qualification	-0.025	
Has a post graduate degree	-0.203	
Has an undergraduate degree	-0.018	
Has a Certificate III/IV, Diploma or Associate Degree	-0.152	
Lives in the most disadvantaged areas (1st quintile)	0.155	
Lives in next most disadvantaged areas (2nd quintile)	-0.011	
Lives in next most advantaged areas (4th quintile)	-0.080	
Lives in the most advantaged areas (5th quintile)	-0.049	
Lives in a non-capital city	-0.026	
Household income	0.000	
Constant	-1.670	***
Sample size	2,799	

Notes: The base case individual is male; aged 35 to 44; non-Indigenous; born in Australia; does not speak a language other than English at home; has completed Year 12 but does not have a post-graduate degree; lives in neither an advantaged or disadvantaged suburb (third quintile); and lives in a capital city.
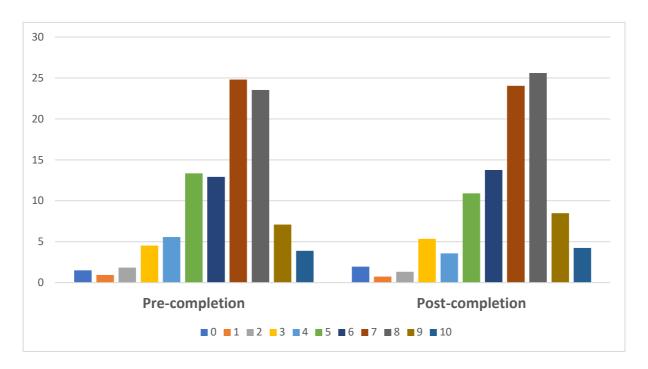
Those coefficients that are statistically significant at the 1 per cent level of significance are labelled ***; those significant at the 5 per cent level of significance are labelled **, and those significant at the 10 per cent level of significance are labelled *.

Source: ANUpoll, April 2020

Moving now to the treatment effects themselves, the average level of life satisfaction for those who completed the question at the start of the survey was 6.50. For those who completed the life satisfaction questions at the end of the survey, the average was 6.63. While this difference was not statistically significant (p-value = 0.260), and provides strong evidence that participating in the survey does not reduce life satisfaction for the entire sample, with weak evidence to suggest that if anything it increases life satisfaction.

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The difference in the distribution of subjective wellbeing scores between the two groups was then tested using a Wilcoxon rank-sum test. The distribution of subjective wellbeing scores for those who responded to the scale at the end of the survey was significantly higher than that of those who answered earlier with a p-value of 0.0821 (that is, statistically significant at the 10 per cent level of significance). A graph illustrating these two distributions is shown in Figure 3. So, this finding suggests that if anything, subjective wellbeing **increases** following asking about COVID-19 and its related impacts.

Figure 3   Differences in subjective wellbeing score distribution between the two experimental groups (%)

The existing literature suggests that survey participation on potentially sensitive topics may have differential effects for particular population subgroups. Results presented in Table 3 give tests for differences in means between the two experimental groups within sub-groups based on socio-economic characteristics, as well as measures that may have a greater propensity to influence subjective wellbeing including financial stress, psychological distress, being tested or having close contact with someone with COVID-19, personal concern for self or family contracting COVID-19, and the participant experience measures.

A key finding from the table is that the small population-level improvement in subjective wellbeing from completing the survey appears to be driven by particular population groups. A significant difference was observed for females only, with no effect observed for males, and for those aged 55-74.

Perhaps more importantly, the difference in reported wellbeing was driven by those who responded early in the survey period. For this group, there was a statistically significant treatment effect (potentially indicating that they may be more enthusiastic responders) whereas for those who responded later in the survey period the treatment effect was not statistically significant.

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Secondly, the results showed that some population groups showed lower levels of subjective wellbeing (a negative treatment effect) if they were asked the question at the end of the survey. These were individuals who were estimated to have probable serious mental illness based on their responses to the Kessler-6 mental health screening questions (significant at the 1% level), and who were living in financial insecurity (significant at the 5% level). Those who are in the lowest decile of income also showed worsened wellbeing post-completion, however this was significant only at the 10% level. For those who had been tested or had close contact with a COVID-19 case, those who are concerned about COVID-19, those who experienced survey distress, and those who were not glad to have participated in the survey, no significant difference between the two experimental groups was observed. It should be noted that the sample size for these groups is relatively small, which may be driving the non-significant effects (that is, Type-II error).

Table 3   Results from subgroup comparisons

Subgroup	Subjective wellbeing higher…	Subgroup	Subjective wellbeing higher…
Gender		Income decile	
Females	Post-completion (p=0.0186)	Decile 1	Pre-completion (p=0.0959)
Males	-	Decile 2	-
Age		Decile 3	Post-completion (p=0.0409)
18-24	-	Decile 4	-
25-34	-	Decile 5	-
35-44	-	Decile 6	-
45-54	-	Decile 7	-
55-64	Post-completion (p=0.0853)	Decile 8	-
65-74	Post-completion (p=0.0309)	Decile 9	-
75+	-	Decile 10	-
Indigenous status		Comfort on present income	
Indigenous	-	Living comfortably	Post-completion (p=0.0020)
Non-Indigenous	-	Coping	Post-completion (p=0.0909)
Birthplace		Finding it difficult	-
Born in English-speaking country	-	Finding it very difficult	-
Born in non-English speaking country	Post-completion (p=0.0885)	Food security	
Language		Food secure	Post-completion (p=0.0668)
Language other than English	-	Food insecure	-
English only	-	Financial stress	
		Living in financial stress	Pre-completion (p=0.0346)
		Not living in financial stress	Post-completion (p=0.0017)

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Education		Probable serious mental illness	
Less than year 12	-	Probable serious mental illness	Pre-completion (p=0.0094)
Vocational qualifications	-	No probable serious mental illness	Post-completion (p=0.0340)
Undergraduate qualifications	Post-completion (p=0.0726)		
Postgraduate qualifications	-		
SEIFA score		**Personal experience with COVID-19**	
Quintile 1	Post-completion (p=0.0991)	Personally affected by COVID-19	-
Quintile 2	-	Not personally affected by COVID-19	Post-completion (p=0.0533)
Quintile 3	-	**Concern regarding COVID-19**	
Quintile 4	-	Very concerned	-
Quintile 5	-	Somewhat concerned	-
Time of interview		Not very concerned	-
Early responder (14-16 May)	Post-completion (p=0.0181)	Not at all concerned	-
Late responder (after 16 May)	-	**Survey distress**	
		Self-reported distress	-
		No self-reported distress	-
		Survey satisfaction	
		Glad to have participated	-
		Not glad to have participated	-

Notes: The base case individual is male; aged 35 to 44; non-Indigenous; born in Australia; does not speak a language other than English at home; has completed Year 12 but does not have a post-graduate degree; lives in neither an advantaged or disadvantaged suburb (third quintile); and lives in a capital city.

Those coefficients that are statistically significant at the 1 per cent level of significance are labelled ***; those significant at the 5 per cent level of significance are labelled **, and those significant at the 10 per cent level of significance are labelled *.

Source: ANUpoll, April 2020

Taken together, the results presented in Table 3 may indicate that the improved life satisfaction scores observed for those who answered post-survey completion may be driven through a positive reinforcement, for a large portion of the population, that they are in a relatively secure position. For those in a less secure position, that is they had high levels of psychological distress or a relatively poor financial position, the effect may be in the opposite direction and act as a negative reinforcement. On balance though, averaged across the population, participation in the survey appears to be a mildly positive experience with regards to subjective wellbeing.

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5   Concluding comments

During a time of heightened need for social and economic analysis, there has been a simultaneous increase in new surveys (for example the Household Impacts of COVID-19 survey undertaken by the Australian Bureau of Statistics) as well as a suspension of existing surveys that were deemed to be too problematic or risky (for example the Longitudinal Study of Australian Children). There is an increased demand for new survey data to track the social, economic, and health impacts of COVID-19, alongside legitimate concerns regarding the effect of data collection on respondents, and the difficulty of continuing standard collection modes.

Life in Australia™ participants are highly experienced survey participants, expect to be undertaking at least one survey per month, are representative of the Australian population, and have shown a willingness to keep undertaking surveys even in times of uncertainty prior to COVID-19 (for example the 2019/20 summer bushfires). This readily available national probability-based sample is thus well suited to measuring the impacts of participating in a COVID-19 survey.

Using three data items from the April ANUpoll, we find at a population-level that there is some evidence for survey participation having a positive effect for some participants. The vast majority of respondents said that they were glad they participated; very few said participation was distressing – and even amongst those who said participation was distressing, most still said they were glad to have done so (albeit with a negative relationship between distress and being glad to have participated). This finding is likely to be of interest to Human Research Ethics Committees around Australia, who are paying special attention to potential benefits over risks – not an easy task within the myriad of potential impacts of COVID-19 on diverse populations.

Our experimental data has also shown that at a population level, there was improved reporting of wellbeing post-completion of the April ANUpoll survey, at least for some population groups. Analysis of the data has illustrated that this effect may be driven by females, individuals who are not experiencing financial distress, and those who are not experiencing other measures of distress such as probable serious mental illness, those without personal experience of COVID-19, and those who are not personally concerned about COVID-19. The positive effect also appears to be largest for those who completed the survey early in the survey window. However, it is important to note that certain population groups reported worsened subjective wellbeing post-completion – most notably those on low incomes, those in financial stress, and those with probable serious mental illness.

Our findings do not, of course, show that there are no circumstances under which survey participation will have negative outcomes, that the relatively successful public health measures in Australia (with low infection and mortality rates) haven't affected our results, or that there aren't population groups that do not make up a large part of Life in Australia™ that may find such surveys distressing. We recommend that participant wellbeing continues to be monitored and tested in different contexts and across the duration of the COVID-19 pandemic. Our results do show, however, that for a probability-based panel like Life in Australia™ the benefits to the survey (and policy) community of undertaking surveys during a pandemic do not come at the cost of the wellbeing of participants.

Appendix 1   About the survey

The primary source of data for this paper is the April ANUpoll.[2] Fieldwork for the survey commenced on the 14th of April and continued for a two-week collection period. The majority of data collection occurred at the start of this survey window, with 52.4 per cent of the sample enumerated in the first two days of full data collection. A total of 3,950 active panel members were invited to take part in the survey, of which 3,155 responded, leading to a completion rate of 79.9 per cent for the survey.

We linked data from previous waves of ANUpoll and from other data collection using Life in Australia™. Between October-December 2019, the panel was refreshed with n = 347 panellists being retired and n = 1,810 new panellists being recruited. This recruitment used a G-NAF (Geocoded National Address File) sample frame and push-to-web methodology. Only online participants were recruited in order to balance the demographics (the age profile of panel members was older and more educated than that of the Australian population). The recruitment rate (RECR) for the replenishment was 12.1 per cent.

The Social Research Centre collected data online and through Computer Assisted Telephone Interviewing (CATI) in order to ensure representation from the offline Australian population. Around 6.5 per cent of interviews were collected via CATI. The contact methodology adopted for the online Life in Australia™ members is an initial survey invitation via email and SMS (where available), followed by multiple email reminders and a reminder SMS. Telephone non-response of panel members who have not yet completed the survey commenced in the second week of fieldwork and consisted of reminder calls encouraging completion of the online survey.

The contact methodology for offline Life in Australia™ members was an initial SMS (where available), followed by an extended call-cycle over a two-week period. A reminder SMS was also sent in the second week of fieldwork. Taking into account recruitment to the panel, the cumulative response rate for this survey is 8.1 per cent.

Unless otherwise stated, data in the paper is weighted to population benchmarks. For Life in Australia™, the approach for deriving weights generally consists of the following steps:

1. Compute a base weight for each respondent as the product of two weights:

   a. Their enrolment weight, accounting for the initial chances of selection and subsequent post-stratification to key demographic benchmarks

   b. Their response propensity weight, estimated from enrolment information available for both respondents and non-respondents to the present wave.

2. Adjust the base weights so that they satisfy the latest population benchmarks for several demographic characteristics.

The ethical aspects of this research, including the tests for participant wellbeing, have been approved by the ANU Human Research Ethics Committee (2014/241).

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[2] doi:10.26193/HLMZNW

Appendix 2 Output from binary and ordered logit models

Table 4 Models for distress and participation satisfaction

	Binary distress		Ordered distress		Binary glad		Ordered glad	
	Coeff.	Signif.	Coeff.	Signif.	Coeff.	Signif.	Coeff.	Signif.
Female	0.177		-0.01		0.246		0.189	*
Aged 18 to 24 years	0.265		0.233		1.349		-0.378	*
Aged 25 to 34 years	0.684	*	0.152		0.611		-0.01	
Aged 45 to 54 years	-0.25		-0.056		0.413		0.15	
Aged 55 to 64 years	-0.334		-0.277		0.252		0.203	
Aged 65 to 74 years	-0.079		-0.372	*	-0.041		0.324	*
Aged 75 years plus	-0.114		-0.506	*	0.502		0.691	***
Indigenous	0.017		0.616		-2.084	***	-0.554	
Born overseas in a main English speaking country	0.386		0.152		0.156		0.107	
Born overseas in a non-English speaking country	0.842	**	0.798	***	-0.633		-0.048	
Speaks a language other than English at home	0.596		0.332		0.906		0.194	
Has not completed Year 12 or post-school qualification	0.421		-0.14		-0.332		0.142	
Has a post graduate degree	0.458		0.071		-0.01		-0.354	*
Has an undergraduate degree	0.279		-0.258		-0.13		-0.195	
Has a Certificate III/IV, Diploma or Associate Degree	0.621		-0.024		0.521		0.05	
Lives in the most disadvantaged areas (1st quintile)	-0.55		-0.286		0.485		0.108	
Lives in next most disadvantaged areas (2nd quintile)	-0.569		-0.141		0.417		0.081	
Lives in next most advantaged areas (4th quintile)	-0.612		-0.335		0.23		0.133	
Lives in the most advantaged areas (5th quintile)	-0.47		-0.313		0.598		0.131	
Lives in a non-capital city	-0.727	**	-0.225		-0.385		-0.225	*
Household income	-0.000	*	-0.000	**	0		0	
Constant	-2.776	***			2.342	***		
Cut-off 1			0.096				-4.414	***
Cut-off 2			0.538	*			-4.134	***
Cut-off 3			0.991	***			-3.989	***
Cut-off 4			1.410	***			-3.608	***
Cut-off 5			1.717	***			-3.260	***

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Cut-off 6		2.397	***		-1.805	***
Cut-off 7		2.847	***		-1.433	***
Cut-off 8		3.481	***		-0.807	***
Cut-off 9		4.142	***		0.147	
Cut-off 10		4.744	***		0.750	**
Sample size	2797	2797		2797	2797	

Notes: The base case individual is male; aged 35 to 44; non-Indigenous; born in Australia; does not speak a language other than English at home; has completed Year 12 but does not have a post-graduate degree; lives in neither an advantaged or disadvantaged suburb (third quintile); and lives in a capital city.

Those coefficients that are statistically significant at the 1 per cent level of significance are labelled ***; those significant at the 5 per cent level of significance are labelled **, and those significant at the 10 per cent level of significance are labelled *.

Source: ANUpoll, April 2020

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Table 5   Coefficients, Z-score and p-values for each variable's relationship with distress and participation satisfaction, while controlling for other socio-demographic characteristics

Variable	Distress binary	Distress continuous	Glad binary	Glad continuous
Comfort on income				
-Coping on present income	β = 0.672 Z = 2.04 P = 0.041	β = 0.245 Z = 1.74 P = 0.081	β = 0.240 Z = 0.66 P = 0.511	β = 0.052 Z = 0.47 P = 0.636
-Finding it difficult on current income	β = 1.06 Z = 2.83 P = 0.005	β = 0.649 Z = 3.60 P = 0.000	β = 0.050 Z = 0.11 P = 0.909	β = 0.104 Z = 0.69 P = 0.488
-Finding it very difficult on current income *Base case 'Living comfortably on current income	β = 1.02 Z = 2.31 P = 0.021	β = 0.811 Z = 3.27 P = 0.001	β = 2.32 Z = 3.01 P = 0.003	β = 0.279 Z = 1.31 P = 0.189
Food insecure *Base case 'Food secure'	β = 0.487 Z = 1.23 P = 0.218	β = 0.771 Z = 3.67 P = 0.000	β = 1.490 Z = 1.94 P = 0.053	β = 0.141 Z = 0.68 P = 0.496
Financial stress *Base case 'No financial stress'	β = 0.736 Z = 3.02 P = 0.003	β = 0.656 Z = 5.03 P = 0.000	β = 0.010 Z = 0.03 P = 0.974	β = -0.149 Z = -1.32 P = 0.187
Probable serious mental illness *Base case 'No probable serious mental illness'	β = 0.769 Z = 2.50 P = 0.012	β = 0.702 Z = 4.00 P = 0.000	β = 0.592 Z = 1.05 P = 0.294	β = 0.023 Z = 0.12 P = 0.901
Personal experience of COVID-19 *Base case 'No personal experience of COVID-19'	β = 0.394 Z = 1.00 P = 0.319	β = 0.422 Z = 2.15 P = 0.032	β = 0.497 Z = -0.68 P = 0.497	β = -0.088 Z = -0.54 P = 0.589
Personally concerned about COVID-19 *Base case 'Not personally concerned about COVID-19	β = -0.199 Z = -0.79 P = 0.429	β = 0.233 Z = 1.75 P = 0.080	β = -0.089 Z = -0.27 P = 0.785	β = 0.082 Z = 0.75 P = 0.455

Notes: The base case individual is male; aged 35 to 44; non-Indigenous; born in Australia; does not speak a language other than English at home; has completed Year 12 but does not have a post-graduate degree; lives in neither an advantaged or disadvantaged suburb (third quintile); and lives in a capital city.

Those coefficients that are statistically significant at the 1 per cent level of significance are labelled ***; those significant at the 5 per cent level of significance are labelled **, and those significant at the 10 per cent level of significance are labelled *.

Source: ANUpoll, April 2020

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