Cardus Education Survey Australia

Methodological report

January 2020

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Contents

I. Introduction / Background

A. Background/Objectives

Since 2011, the Cardus Education Survey has been collecting data on independent school graduates in the U.S.A. It is the only international survey that compares graduate outcomes of Kindergarten to Year 12 education at different school sectors, such as Protestant, Catholic, Independent non-religious and public schools. The Cardus Education Survey measures academic, religious, civic and social outcomes and is an important piece of empirical research.[1]

Christian Schools Australia (CSA) as part of the Cardus Education Survey (CES) Australia Project Team, wanted to explore if there was any effect of school type attended on certain life aspects of individuals, including:

- career pathway(s);
- educational attainment;
- social/ community contributions;
- values perspectives and views on marriage, family, religion and ethics; and
- overall, to measure the public good (if any) of private education.

The survey was administered to people aged 25 to 39 years because this is an age group where some life experience and achievements have been accomplished, and one's secondary school experience is not too distant to enable reasonably accurate recall of key experiences and influences at secondary school.

The survey administered in the U.S was conducted solely online. However, in Australia both online and computer assisted telephone interview (CATI)[2] methodologies were adopted. The reason for the Australian approach was that CATI research is regarded by Australian government agencies as the 'gold standard' in survey research in terms of generating accurate estimates of underlying population parameters.

It was intended that the CATI data collection exercise would be used to validate the online survey results (from which the majority of survey responses were obtained in order to minimise total survey cost).

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[1] Tyndale Communications 2019, *Dr. Beth Green Unpacks the Cardus Education Survey*, viewed 20 November 2019, <https://www.tyndale.ca/university/news/dr-beth-green-unpacks-the-cardus-education-survey>

[2] CATI interviews were live interviews conducted by trained interviewers.

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II. Methodology

A. Questionnaire refinement

The original survey instrument was designed by Cardus (head office in Ontario, Canada). The instrument was later refined and developed by the University of Notre Dame (Indiana, USA). Designed for online data collection, the questionnaire took approximately 30 minutes to complete in its original form.

To minimise respondent burden, the Australian version of the survey was shortened to 15 minutes. The process of removing questions from the instrument was conducted by the CES Australia Project Team.

It was also necessary to develop a CATI version and an online version of the questionnaire. The CATI version contained fewer questions due to the additional time taken for interviewers to read out each question and response option. The online version contained more questions as participants can respond more quickly using a self-administered survey.

In close consultation with the CES Australia Project Team, ORIMA reviewed and updated the survey instrument to ensure that it was suitable in an Australian context; that terminology, expressions or processes described would be readily understood by the target participants.

The Australian version of the questionnaire was designed to collect data on the location and school type (Catholic, Independent, Christian, Government) of the secondary school the respondent attended through years seven to twelve. In contrast, the U.S version focussed on the secondary school respondents graduated from. The school type the respondent attended most was chosen and was the focus of questioning for the remainder of the survey. This approach was adopted because:

- not all Australians complete secondary school or 'graduate'. Some students stream into other vocational educational training at alternate tertiary, but non-university institutions to compete apprenticeships, trade certificates or related certification;

- some Australians may have attended the majority of their secondary school years at a Christian school but then graduate from a different school type or vice versa. This is because families move, financial situations change, and the availability of certain school types may vary throughout a student school career; and

- it was believed that maximum years attended by school type may have had a stronger influence on the intended items to be measured, than the graduating year – graduation is significant, but also a relatively small cross-sectional aspect of the school experience, whereas asking about the whole experience provides a more systemic view.

Final questionnaire versions were approved by the CES Australia Project Team and can also be found in Attachment A.

B. Sample selection

Assumptions

School type population profile of 25-39 year olds

Based on school enrolment statistics between 1970 to 2017 provided by the CES Australia Project Team[3], it was estimated that the proportion of 25-39 year olds in Australia that went to independent secondary schools was approximately 15% of the population, and Christian Schools made up about one third of independent school enrolments.

It was therefore expected that approximately 5% of the general population aged 25 to 39 would have attended a Christian school at some stage during their secondary schooling career (refer to Table 1 below).

Table 1: Population assumptions of secondary school types attended for 25-39 year olds in Australia

Secondary School Type	Proportion attended
Independent Schools	10%
Christian Schools	5%
Catholic Schools	23%
Government	62%
Total	**100%**

Gender and geographic population profiles of 25-39 year olds in Australia

Data from the Australian Bureau of Statistics was utilised to derive population profiles for the 25-39 age cohort by gender and state (metro/-non-metro)[4]. These profiles formed the basis of soft targets for CATI and online data collection.

Table 2: Population profile of 25-39 year olds by gender and state (metro – non metro)

State/ territory	Males 25-39	Females 25-39	Total aged 25-39
NSW metro	13%	13%	26%
NSW non-metro	3%	3%	6%
VIC metro	11%	11%	22%
VIC non-metro	2%	2%	4%
QLD metro	6%	7%	13%

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[3] Independent Schools Council of Australia, 2018, *Snapshot 2018,* viewed 21 November 2019, <https://isca.edu.au/snapshot-2018/>

[4] ABS Census 2016 (ASGS Classification)

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State/ territory	Males 25-39	Females 25-39	Total aged 25-39
QLD non-metro	3%	3%	6%
WA metro	4%	5%	9%
WA non-metro	1%	1%	2%
SA metro	3%	3%	5%
SA non-metro	1%	1%	1%
TAS non-metro	1%	1%	2%
ACT metro	1%	1%	2%
NT non-metro	1%	1%	1%
Total aged 25-39	**49%**	**51%**	**100%**

Targets

Soft targets were set for the CATI and online data collection streams. Targets for school type and other demographics were not interlocking.

Online by school type

It was estimated that around 8,000 online panellists would need to be engaged to achieve n=400 online completions for the Christian School cohort (based on the estimated 5% incidence) (refer to Table 3 below).

Table 3: Original and revised online targets by school type

Secondary School Type	*Original online targets n=	Estimated incidence in Australian population	Revised online targets n=
Independent Schools	800	10%	900
Christian Schools	400	5%	400
Catholic Schools	1,840	23%	690
Government	4,960	62%	930
Total sample	**8,000**	**100%**	**2,920**

Panel engagements needed to achieve targets	8,000

* Targets based on estimated population incidence of school type attended in the Australia wide

Catholic and Government schools' online sample targets were downsized to assist with cost minimisation, while retaining a sample size large enough for comparative analysis.

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CATI by school type

CATI targets were also based on estimates of attendance by school type within the Australian population (refer to Table 4 below).

Table 4: CATI targets by school type

Secondary School Type	Estimated incidence in Australian population	*CATI targets n=
Independent Schools	10%	100
Christian Schools	5%	50
Catholic Schools	23%	230
Government	62%	620
Total sample	**100%**	**1000**

* Targets based on estimated population incidence of school type attended in the Australia wide

Overall targets by school type

Table 5 below shows the total sample targets by school type.

Table 5: Overall targets CATI & Online by school type

Secondary School Type	Targets		Total
	Online n=	CATI n=	Total n=
Independent schools	900	100	1000
Christian schools	400	50	450
Catholic schools	690	230	920
Government schools	930	620	1550
Total	**2,920**	**1,000**	**3,920**

Sample sources

Online

Sample for the online survey was sourced from panel provider The Online Research Unit's (ORU) panel.

The ORU's panels are managed by a dedicated panel management team. Used for research-only, their panels are regularly subjected to cleaning, de-duplication and updating. A dedicated panel helpdesk, mixed incentives scheme and a wide variety of research topics keep panellists interested and engaged. They comply strictly to privacy and anti-spam laws and their processes are ISO-accredited.

The ORU have over 350,000 persons listed on their panel Australia wide. The ORU obtained additional sample from their panel partners.

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The ORU utilised n=6,000 of their own panellists and n=2,000 of their partner panel panellists to achieve a minimum of n=400 completed surveys by those having attended a Christian school.

CATI

A specialist, ISO-accredited, CATI fieldwork provider (Lighthouse Data Collection) was commissioned to conduct the CATI fieldwork.

There was a series of factors to consider in conducting a CATI survey among the general population targeting the 25 to 39 year old age group, particularly as this cohort has a prevalence of mobile telephone only households well above the national average[5]. In deciding on an appropriate sample frame (list of telephone numbers from which to contact potential survey respondents) for this cohort, the following factors were taken into consideration.

Research has shown that the demographic distribution of potential respondents contactable by mobile telephone closely matches the overall demographic distribution of the population[6].

In surveys using landline telephone numbers, within-household selection is complex in two ways for the target population. First, within a contacted household the person most likely to answer will not be in the 25-39 age bracket. Second, in the case of more than one eligible household member (aged 25-39), there must be a random selection of all eligible members. This will become more complicated in shared households (which is relatively prevalent within this population). Further, from a purely methodological viewpoint, within household selection increases the variance of the weights – increases error. Also, selecting an individual who is not present requires re-contacting the household, which in turn increases the probability of non-response.

The population being sampled (particularly those under 30 years old), are routinely shown to be difficult to find within a landline frame. They often opt for VOIP internet services that will respond to being pinged, but will not 'ring' and this causes complications in sample weighting.

Many survey companies (in the U.S.) are opting to conduct surveys via solely mobile telephone number frames (particularly when dealing with difficult to reach populations that have a greater propensity to be mobile-only).

It is for these reasons that it was decided to source an all mobile telephone number sample from sample provider SamplePages. A total of 8,000 mobile number were sourced and selected at random. Each mobile number was attached to a unique address with age and gender demographics identified. This enabled the source to be stratified by age, gender and state (metro-non metro) demographics (refer to Table 6 overleaf).

This approach was recommended by the specialist social survey statistician (Dr Bernard Baffour, Senior Lecturer, Australian National University) engaged by ORIMA Research to advise on sampling for the survey and to conduct statistical weighting.

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[5] Baffour, B., Haynes, M., Dinsdale, S., Western, M., and Pennay, D. (2016). Profiling the Mobile-only Population in Australia: Insights from the Australian National Health Survey. Australian & New Zealand Journal of Public Health. **40(5)**, 443-447.

[6] ibid

Table 6: CATI Call Sample supplied by SamplePages*

State / territory	Total Males 25-39	Total Females 25-39	Total aged 25-39
NSW metro	1032	1056	2088
NSW non- metro	220	229	449
VIC metro	872	894	1766
VIC non-metro	167	177	345
QLD metro	516	538	1054
QLD non-metro	242	250	491
WA metro	359	362	721
WA non-metro	94	86	180
SA metro	204	208	412
SA non-metro	56	56	112
TAS non-metro	68	73	141
ACT metro	72	75	147
NT non-metro	48	46	94
Total aged 25-39	**3,950**	**4,050**	**8000**

*Note that target proportions are based on ABS data as per Table 2

C. Fieldwork

CATI – Pilot and launch

CATI participants were called from a list containing only mobile phone numbers stratified as described previously. Participants did not receive invitation letters or emails.

Lighthouse Data Collection conducted a pilot among 31 participants on 29 October 2019 and provided the following feedback:

- *Survey length was 15.9 minutes but was expected to reduce back to 15 minutes.*

Overall feedback from the interviewers was good overall and reported that the questionnaire flowed well. There were a few suggestions for improvement:

Table 7: Feedback from the CATI pilot

Question	Issue	Resolution
SCH04(e): How much do you agree or disagree with the following statements relating to this school: e) Spiritual/ religious values were a very important feature of my school community	Respondent having difficulty with the combined spiritual/ religious values. Can the response be based on one or the other and obviously both if relevant?	The question was intended to mean **spiritual OR religious** values. Question remained unchanged and was an interviewer briefing issue.

ORIMA
RESEARCH

Question	Issue	Resolution
SCH05(e): Still thinking about your secondary school experience at [SCHOOL, DISPLAYED AT SCHO4]. How satisfied or dissatisfied did you feel about: e) The way your school discussed religious and spiritual matters	Allowing a "not applicable" option as respondents are saying this was not discussed at school especially for Government/ State schools.	"Not applicable" added for option "e" only
SCH06(e): How well would you say [SCHOOL, DISPLAYED AT SCHO4] prepared you for each of the following: e) Dealing with the problems of life.	Allowing a "not applicable" option.	"Not applicable" was not allowed as this is a generic question that all schools would engage with in some capacity. A clarification was added. e) Dealing with the problems of life **(life skills in general, when things go wrong, resiliency)**
COMR2: Do you belong to any of the following groups or associations?	Allowing a refusal option for Political Party and Trade Union.	Refusal for those options was added
COMR10: What was the total amount of all donations in the last 12 months to [each YES options from COMR9]	Including a clarification of 'after all donations (this includes money and goods)'.	Wording changed to clarify after each option as suggested. "What was the total amount of all donations in the last 12 months to **(this can include money and value of goods)**" [each YES options from COMR9]
SPIR3 (a): In the last 12 months, how often, if ever, did you a) Attend a church or religious service	Respondents assumed this question refereed to sermons, but should be clarified to exclude weddings, christenings or funerals.	Question modified to include suggested clarification. Attend a church or religious service **(excluding weddings, christenings or funerals)**
SPIR3 (b): In the last 12 months, how often, if ever, did you b) Pray	Allowing a refusal option.	Refusal code added for this option
ETHE: What is your ethnic origin?	Respondents were confused about what was being asked. They thought that this might be their place of birth.	Added briefing note for interviewers: "Treat as the ethnicity you may identify with respect to ancestry, not where you were born necessarily)"

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Once the issues above were resolved a full launch was progressed for CATI. The CATI fieldwork was completed on 25 November 2019.

Online

The changes made to the CATI survey were also made to the online version.

The ORU sent online panel participants an invitation to participate in the research containing a unique link to the online survey. Fieldwork for the online survey was conducted over 6-18 November 2019. Participants were able to return to the survey and complete it in more than one sitting.

Additional online data collection

Following the CATI and online data collection period that ended in November 2019, the survey data was checked and cleaned to ensure its quality and integrity. During this process, a number of inconsistent responses emerged between SCH03X_1 (type of school) and the school name typed in by the respondent in the 'other, please specify' field (if their school was not in the provided drop-down list of Christian Schools). Where respondents miscategorised the type of school they attended, their response was 'back-coded'/ re-categorised into the appropriate response option at SCH03X_1. For example, a respondent specified they attended 'Whitfield state school' and selected 'Non-Denominational/ Other' as the school type. As this is a government/state school, this was 'back-coded' into 'Government/ State' (option 1). There were also other instances where respondents entered a Catholic school name in this field, but selected 'Non-Denominational/ Other' as the school type. Most changes made were based on information sourced from a Google search or clarified by CSA. These changes had implications for the final number of Christian schools in the survey data (n=260) which was lower than the expected target (n=400).

Table 8 summarises the responding sample profile by school type for the October-November 2019 data collection. These figures imply that the assumed population incidence rate (that approximately 5% of the general population aged 25 to 39 will have attended a Christian secondary school) underpinning the set targets was too high – in the end, the incidence rate among online panellists was 3% (242 divided by 8,000 panellist responses) and among CATI respondents was 2% (18 divided by 1,000 CATI responses).

Table 8: Responding sample profile by school type for October-November 2019 data collection

Secondary School Type	Online n=		CATI n=		Total	
	Target	Responding sample	Target	Responding sample	Target	Responding sample
Independent schools	900	975	100	97	1000	1079
Christian schools	**400**	**242**	**50**	**18**	**450**	**260**
Catholic schools	690	751	230	228	920	979
Government schools	930	1,605	620	657	1550	2262
Total	**2,920**	**3,576**	**1000**	**1,000**	**3,920**	**4,576**

After discussions with the CSA project team, it was agreed that additional online data would be collected that would:

ORIMA RESEARCH

- only target Independent and Christian schools to add an additional n=300 responses to the existing survey data in order to primarily boost the number of Christian schools;
- involve another n=2,000 panel member engagements – The ORU re-contacted members who did not previously participate to encourage participation, as well as obtained 'fresh' sample from their panel partner; and
- be merged with the existing online and CATI online data collected over October and November 2019.

The additional online data was collected over 12-17 December 2019 after minor updates were made to the online questionnaire following the learnings from the data cleaning process of the October-November 2019 survey data (see Table 9).

Table 9: Updates to the online questionnaire following October-November 2019 data collection

Original question	Revised wording (marked in bold)
SCH03X. And what type of school was it? Option 1: Government/ State Option 3e: Non-denominational/ other	 Option 1: Government/ State**/ 'Public' school** Option 3e: Non-denominational/ other **Christian school** Option 6: **Other (please specify)** • This was a new response option for respondents who attended Independent schools with no religious affiliations or other schools such as Jewish or Islamic schools

D. Data cleaning

All data collected via the survey was checked and cleaned to ensure its quality and integrity. Data validation procedures conducted included:

- **Checking the logic of responses.** The table below provides a summary of the issues found during the data cleaning process.

Table 10: Issues found following checks of the logic of responses

Question	Issue	Survey version	Resolution
SCH00x. Did you attend the same Australian secondary school from year 7 up to year 12?".	66 respondents answered 'no' to this question, but they only provided responses to one school in *SCH03. For the [first, second, third, as applicable] secondary school you attended, what year levels did you attend? Select all that apply*.	Online	Response at SCH00x was changed from 'no' to 'yes'
SXH02X1, SCH02X2, SCH03, SCH03X	Around 150 respondents provided anomalous responses to these questions. For	Online	These respondents have been flagged in the dataset under the variable 'anomalous'. As the

Question	Issue	Survey version	Resolution
	example, some respondents indicated they attended all grades across five different schools or indicated they did not complete any grades apart from year 12 across five different schools.		number of grades and schools cannot be deduced from other data, we have not made any changes. Please refer to Attachment B for the list of anomalous responses.

- **Validation of questionnaire filtering to ensure survey questions were only answered by appropriate respondents**. The table below provides a summary of the issues found.

Table 11: Issues found following validation of questionnaire filtering

Question	Issue	Survey version	Resolution
SCH00x. Did you attend the same Australian secondary school from year 7 up to year 12?".	40 respondents did not answer this question as they most likely participated in the survey prior to the addition of this question.	Online	36 of respondents only selected grades from one school in SCH03 – a response of 'yes' was added to SCH00x for these respondents.
SCH00x. Did you attend the same Australian secondary school from year 7 up to year 12?".	Another four respondents did not answer this question as they most likely participated in the survey prior to the addition of this question.	Online	A response to SCH00x could not be deduced and has been left blank. These respondents provided an anomalous response to SCH03 – three of these respondents indicated they attended all grades (7-12) across five schools and one respondent indicated they attended all grades across four schools
SCH00x. Did you attend the same Australian secondary school from year 7 up to year 12?".	Another seven respondents did not answer this question as they most likely participated in the survey prior to the addition of this question.	Online	As these respondents selected grades across multiple schools in SCH03, a response of 'no' was added to SCH00x.
SCH03. For the [first, second, third as applicable] secondary school you attended, what year levels were they?	This question was not asked of CATI survey respondents if they attended the same secondary school from year 7 to up to year 12. As this was not asked, it cannot be assumed that all these respondents completed year 7 and up to (and including year 12) as some may have only completed up to year 10.	CATI	No action undertaken as it cannot be deduced accurately which grades these respondents completed.
SCH03X_1-5. What type of school was it?	Respondents who selected 'Church School' or 'Non-denominational/	Online	Respondents were re-categorised into 'Specific

Question	Issue	Survey version	Resolution
	Other' and selected a school from the Christian Schools list.		Independent School – 'Christian'.

- **'Back-coding' of verbatim survey responses (within 'other (please specify)' response options) into pre-existing or survey response categories for applicable questions**. The table below provides a summary of the issues found.

Table 12: Issues found following back-coding of verbatim survey responses within' other (please specify)' response options

Question	Issue	Survey version	Resolution
SCH03X3e_OTH_1-5. Please select the school you attended if it is displayed in the list - Other, please specify	It was evident that some respondents miscategorised the type of school they attended based on the name of the school they entered for this question. For example, public high schools were classified as 'non-denominational/ other' rather than 'government/ state'.	Online	Responses were changed to the appropriate school type and the school name they specified in the free text field was removed. School types were changed based on results from Google searches. In some instances, clarification from Christian Schools Australia was sought to confirm the school type. Where appropriate, the respondent's main school type was also updated to reflect this change. A new response option ('Other') was added for schools that did not fit into the pre-existing response categories (e.g. Jewish or Islamic schools). These were then grouped as 'independent schools'.
SCH03X3e_OTH_2-4. Please select the school you attended if it is displayed in the list - Other, please specify	A small number of respondents entered out-of-scope schools such as primary schools or schools outside of Australia. These were entered as the second, third or fourth schools they entered.	Online	Responses to the second, third or fourth schools were removed. The number of schools shown at *SCH00. How many secondary schools did you attend from years 7-12?* was also reduced by one.

E. Responding sample profile

The tables below present a profile of the final data collected (unweighted) compared to the original targets.

School type population profile of 25-39 year olds

Table 13: Population assumptions and actual proportion collected of secondary school types attended by 25-39 year olds

Secondary School Type	Assumed Population Proportion	Actual Proportion Collected (Responding online and CATI Sample)
Independent Schools	10%	26%
Christian Schools	5%	7%
Catholic Schools	23%	20%
Government	62%	46%
Homeschooled or did not attend school	-	< 1%
Total	**100%**	**100%**

Gender and geographic population profiles of 25-39 year olds

Table 14: Population and responding sample profile of 25-39 year olds by gender and state (metropolitan and non-metropolitan locations)

State / territory	Males 25-39		Females 25-39		Total aged 25-39	
	Population	Responding Sample*	Population	Responding Sample*	Population	Responding Sample*
NSW metro	13%	13%	13%	12%	26%	25%
NSW non-metro	3%	3%	3%	4%	6%	6%
VIC metro	11%	12%	11%	13%	22%	24%
VIC non-metro	2%	2%	2%	3%	4%	4%
QLD metro	6%	5%	7%	6%	13%	11%
QLD non-metro	3%	2%	3%	4%	6%	6%
WA metro	4%	4%	5%	5%	9%	9%
WA non-metro	1%	< 1%	1%	1%	2%	1%
SA metro	3%	2%	3%	3%	5%	6%
SA non-metro	1%	< 1%	1%	1%	1%	1%
TAS	1%	1%	1%	1%	2%	2%
ACT	1%	1%	1%	1%	2%	2%
NT	1%	< 1%	1%	< 1%	1%	1%
None of the above	-	0%	-	< 1%	-	< 1%
Total aged 25-39	**49%**	**46%**	**51%**	**54%**	**100%**	**100%**

* Includes both online and CATI samples

ORIMA RESEARCH

Table 15: CATI targets and responding sample sizes by school type

Secondary School Type	Estimated incidence in Australian population	*CATI targets n=	Responding sample n=
Independent Schools	10%	100	97
Christian Schools	5%	50	18
Catholic Schools	23%	230	228
Government	62%	620	657
Total sample	**100%**	**1,000**	**1,000**

* Targets based on estimated population incidence of school type attended in the Australia wide

Table 16: Overall CATI & Online targets and responding sample sizes by school type

Secondary School Type	Online n=		CATI n=		Total	
	Target	Responding sample	Target	Responding sample	Target	Responding sample
Independent schools	900	1,195	100	97	1000	1292
Christian schools	400	338	50	18	450	356
Catholic schools	690	760	230	228	920	988
Government schools	930	1,620	620	657	1550	2277
Homeschooled or did not attend school	-	3	-	0	-	3
Total	**2,920**	**3,916**	**1000**	**1,000**	**3,920**	**4,916**

F. Weighting

Weighting adjustments (conducted by specialist social survey statistician, Dr Bernard Baffour) were used to adjust the relative contributions of sample respondents in order to improve the accuracy and representativeness of the survey estimates. This is particularly important due to (a) the complex sampling design, and (b) differences in response and participation.

Data from the census (and other administrative) population data was used to ensure that the distributions of key selected variables (gender, age, educational attainment, employment status, and mobile only prevalence) from the observed sample match the population attributes. This effectively aligns the sample to population benchmarks for a set of characteristics.

Individuals in the sample were given weights which adjusted the observed information to ensure that the sample matched the population for these given characteristics (i.e. gender, age etc.). This was accomplished through a process of iterative proportional fitting (or calibration weighting), using the *ipfweight*[7] Stata module routine in Stata 15.

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[7] Michael Bergmann, 2011. "IPFWEIGHT: Stata module to create adjustment weights for surveys," Statistical Software Components S457353, Boston College Department of Economics.

ORIMA RESEARCH

The population benchmarks used are provided in Table 17 below:

Table 17: Population benchmark characteristics used for calibration weighting

| Characteristic	Proportion
Gender	
Male	0.49
Female	0.51
Age	
25-29	0.34
29-34	0.35
35-39	0.32
State	
NSW	0.318
VIC	0.262
QLD	0.193
WA	0.112
SA	0.065
TAS	0.018
ACT	0.020
NT	0.012
Educational attainment	
University graduate	0.35
Non-university graduate	0.65
Labour force participation	
Employed	0.73
Not Employed	0.27
Mobile phone usage	
Mobile only	0.79
Not mobile only	0.21

Notes:

1. The demographic, state, education and labour force characteristics are obtained from the Australian 2016 census. ABS Census of Population and Housing, 2016, TableBuilder.
2. The information on telephone usage is obtained from the Australian Communications and Media Authority (ACMA) report "Mobile-only Australia: living without a fixed line at home", https://www.acma.gov.au/publications/2019-10/report/mobile-only-australia-living-without-fixed-line-home

Three types of calibration weights were computed: (1) for the full sample, (2) for the CATI only respondents, and (3) for the online only respondents. For each of the three samples, the weights ensure that the estimates coincide with the known population totals (provided in Table 17).

ORIMA RESEARCH

The histograms displaying the distributions of the three calibration weights are shown in Figures 1-3 below:
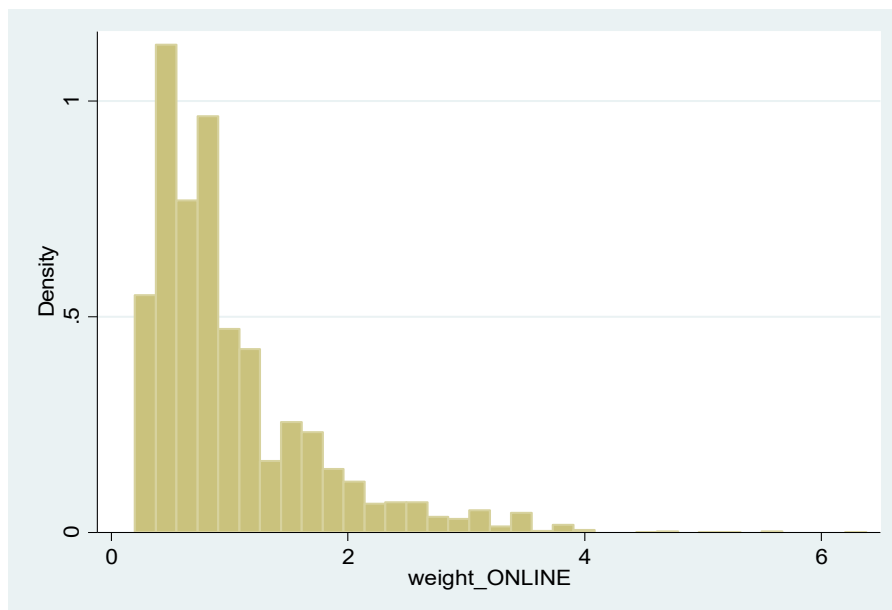
Figure 1: Histogram of the calibration weights (full sample)
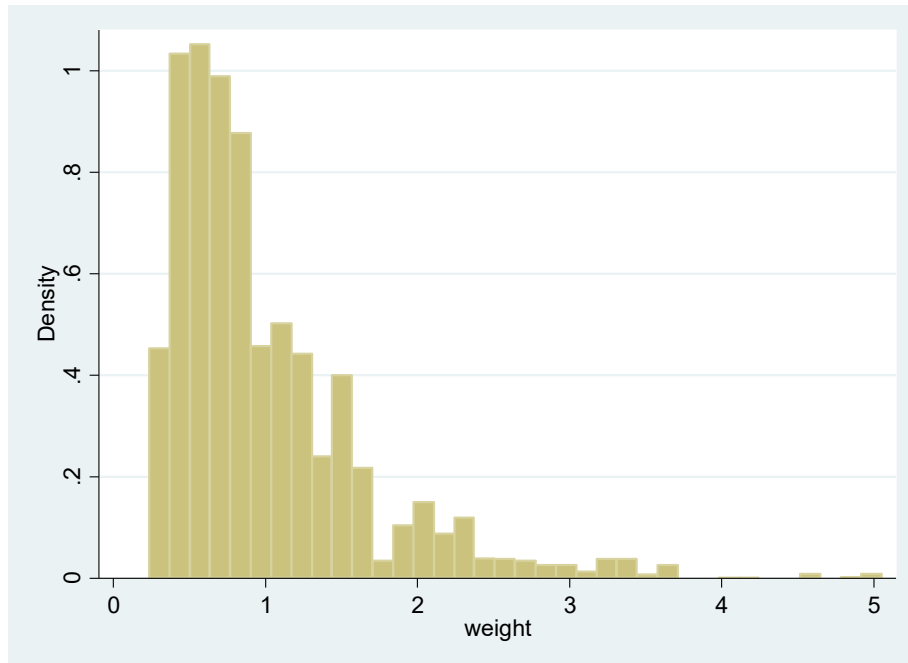
Figure 2: Histogram of the calibration weights (CATI sample)
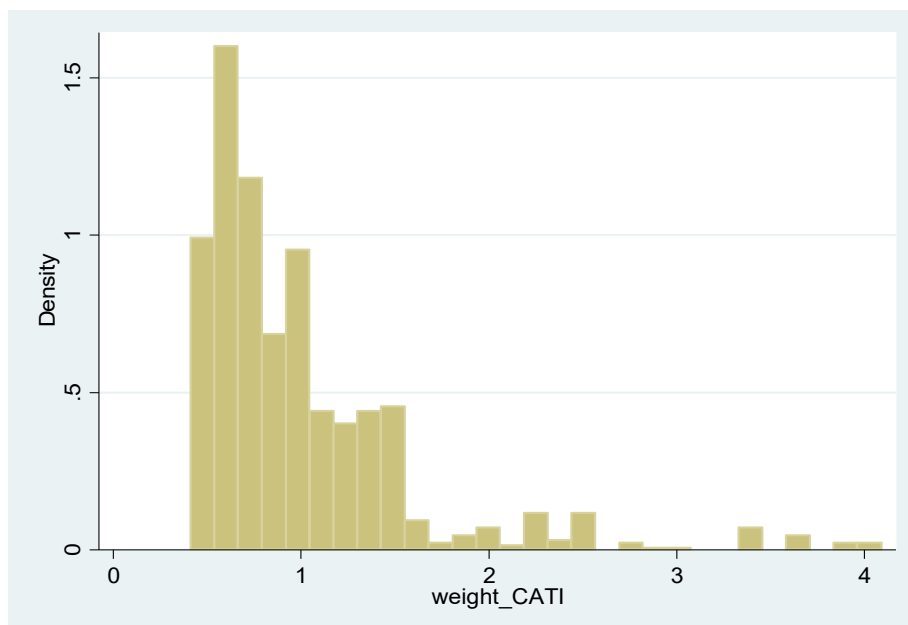
Figure 3: Histogram of the calibration weights (online sample)

Analysis of aggregate data and use of the full sample weight

Caution should be exercised when combining the CATI and online data for analysis at the aggregate level using the full sample weights. The weighted aggregate data will not necessarily reflect the overall population of Australian adults aged 25-49 due to the purposeful oversampling of Christian and Independent schools in the online data. However, when analysing survey data according to school type (e.g. Christian Schools compared to government schools, etc.) there will be a higher degree of accuracy when utilising the full sample weights than when utilising unweighted data.

Comparison of CATI and online survey data

As noted in Section I, it was intended that the CATI data collection exercise would be used to validate the online survey results (from which the majority of survey responses were obtained) as it is regarded by Australian government agencies as the 'gold standard' in survey research in terms of generating accurate estimates of underlying population parameters. For this reason, the online results were compared with the CATI results to check for variances in responses. The comparison[8] found that the average absolute difference in percentage results by mode for 44 key attitudinal and behavioural questions was small (5.8 percentage points (pp)). This indicates that the online results are generally similar to those from the CATI survey and can be combined with the CATI data for analysis purposes.

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[8] For the purposes of this comparison only, an additional calibration process was conducted to correct for the purposeful oversampling of Christian and Independent Schools in the online dataset. This additional calibration process used the weighted CATI secondary school type data as it was considered to be a good estimate of the population prevalence of school type.

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G. Timelines

Below is an outline of the project timing.

Notably, CATI fieldwork had a 26 day duration and online, 12 days.

Table 18: Project timelines

Item	Start	End (completed by)
Project commencement - Contract start date	Friday, 4 October 2019	Friday, 4 October 2019
Project inception meeting	Friday, 4 October 2019	Friday, 4 October 2019
Project plan	Friday, 4 October 2019	Friday, 4 October 2019
Review current questionnaire	Friday, 4 October 2019	Tuesday, 8 October 2019
Draft questionnaire based on review	Friday, 11 October 2019	Friday, 11 October 2019
Finalise questionnaires for online/ CATI programming	Thursday, 24 October 2019	Thursday, 24 October 2019
Program survey Online & CATI	Thursday, 24 October 2019	Sunday, 27 October 2019
Online/CATI survey testing	Sunday, 27 October 2019	Monday, 28 October 2019
Survey (pilot CATI)	Tuesday, 29 October 2019	Tuesday, 29 October 2019
Pilot results / changes from pilot (CATI & Online) if required	Wednesday, 30 October 2019	Wednesday, 30 October 2019
CATI fieldwork	Wednesday, 30 October 2019	Monday, 25 November 2019
Online fieldwork (Part I)	Wednesday, 6 November 2019	Monday, 18 November 2019
Additional online fieldwork (Part II)	Thursday, 12 December 2019	Tuesday, 17 December 2019
Data processing, cleaning and quality control. Merging data files.	Wednesday, 27 November 2019	Friday, 20 December 2019
Analysis (comparing and calibrating CATI and Online results, as well as weighting)	Monday, 6 January 2020	Thursday, 9 January 2020
Methodological report	Friday, 10 January 2020	Monday 20 January 2020
Data delivered in SPSS with data dictionary	Friday, 10 January 2020	Monday 20 January 2020

H. Quality standards

The project was conducted in accordance with the international quality standard ISO 20252 and the Australian Privacy Principles contained in the Privacy Act 1988.