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Survey Research

Features of Surveys

Surveying is a structured method of getting at how people perceive the phenomenon of interest. That phenomenon could be reporting their experiences, their thoughts, their beliefs, opinions, or attitudes, or even their behaviours. Large-scale testing of student knowledge (e.g., PISA, TIMSS, PIRLS) or accountability tests within jurisdictions or attempts to get a sense of the nation (e.g., NAEP, NMSSA, NAPLAN) are also surveys administered usually to targeted samples or to census of all students in a region or grade level. The questionnaire contains tasks or statements which are answered by the participants and which are analysed according to the conceptual considerations used in the design of the survey tool. A lot of opinion or attitude surveys rely on factor analysis, while many tests of knowledge which are scored 0-1 use item response theory methods to create scores.

The fact that the survey is structured means that you ensure that all participants react to all the important aspects of the phenomenon that the researcher has determined matter. The downside is that if participants have responses that have not been anticipated by the survey designer, those reactions will not be captured as they might be in a less-structured design like a focus group or interview. As always it's a trade-off.

In addition, it is possible, especially using online survey methods, to get a lot of data quite quickly. Getting many participants tends to mean that the accuracy of estimation is good and generalisability to the population becomes possible. Good surveying requires that participant samples are robust and representative and generate enough data from each participant to be able to infer valid scores. Simply big is better!

Robustness.

This addresses the question of whether the sample is large enough such that any inferences drawn from it will have error components. This is what is done in opinion polls where inferences about the voting preferences of the total population of voters are drawn from small samples. The margin-of-error in most polls ranges between 3 and 5% with samples that are around 500 out of any large population Thus, any sample that is larger than 1,000 out of the population is going to form the basis for accurate estimates of p⃝lation ability. You can estimate the margin of error using an online tool by RaoSoft. This tool works on the assumption that you obtained participants independent of each other. If participants are collected

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Representativeness:

It's all very well having a large sample but do the participants have the same characteristics as the population which you are actually interested in? The validity of the inferences about the population requires that the sample reflect the diverse and important characteristics of the population. In other words, if the sample were made up of only boys who live in the South Island and attend high decile, single sex secondary schools, then it would be hard to make inferences about the whole New Zealand population which contains girls, students who live in the North Island, students in low to medium decile, or attend co-ed, primary and secondary schools. This means that a sample must contain enough diversity and enough (usually at least 250) students for each of the important categories in the population in order to make robust estimates. To ensure a perfectly representative sample an equal proportion of the population should be sampled from each category in each demographic characteristic.

Data Sufficiency:

Assuming participants are from the population of interest and you have enough of them, do you have enough data from each participant to draw conclusions about their responses to the phenomenon? Students who miss out a lot of questionnaire or test items are problematic; do we know enough about them to draw a valid conclusion about where they lie in terms of the phenomenon? It is highly likely that participants will accidentally skip or miss items or even deliberately refuse to answer some items. That's just how humans behave. While missing value estimation techniques can impute large amounts of missing data, this does not mean that such procedures produce a valid summary of the individual's 'true' response. Generally, small missing amounts can be imputed with sophisticated techniques like expectation maximisation or multiple imputation. But small means no more than 10% of responses missing. More than that it becomes hard to believe that we know what the person might have answered had he or she actually done so.
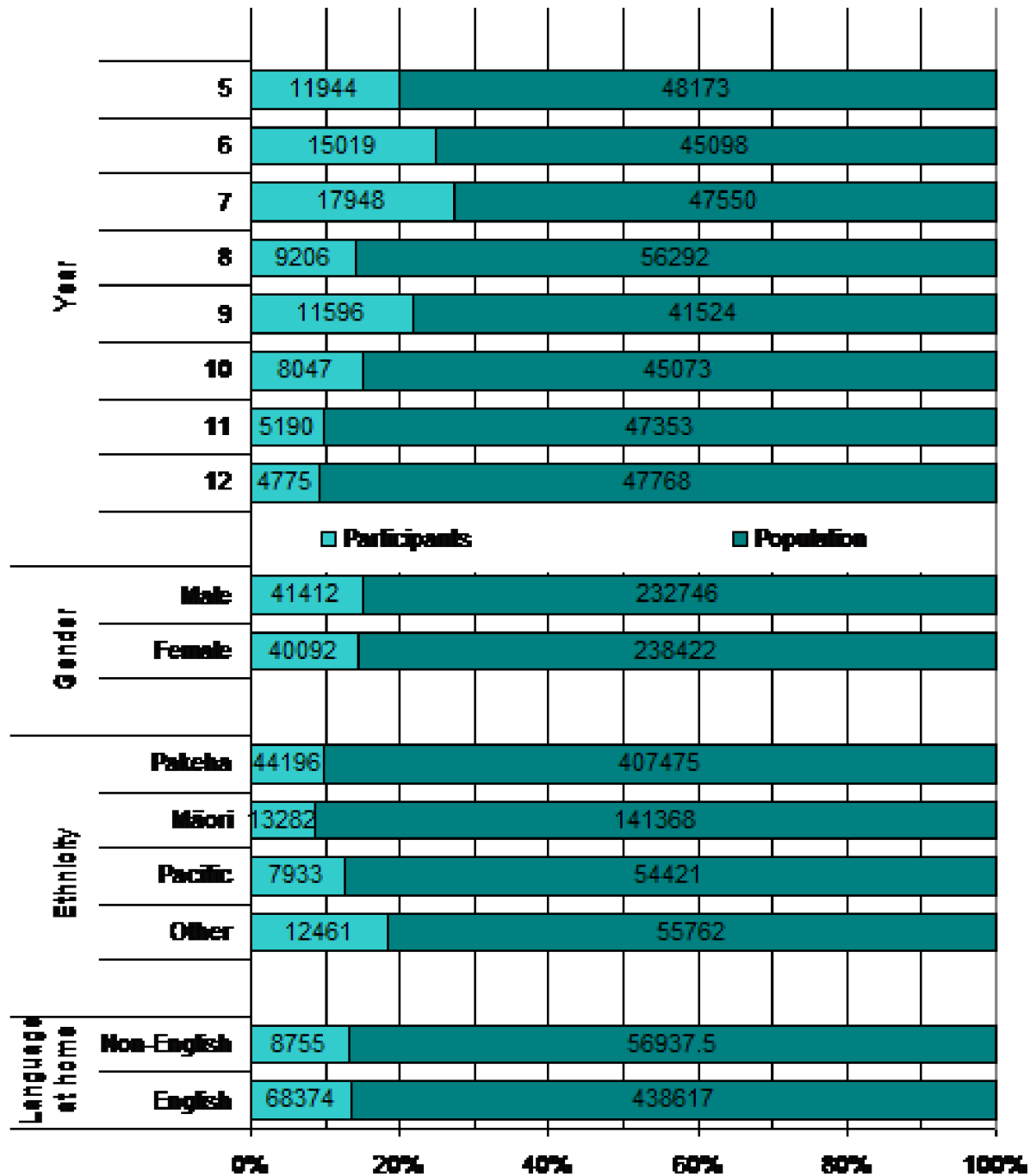
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Category	Group	Participants	Population
Year	5	11944	48173
	6	15019	45098
	7	17948	47550
	8	9206	56292
	9	11596	41524
	10	8047	45073
	11	5190	47353
	12	4775	47768
Gender	Male	41412	232746
	Female	40092	238422
Ethnicity	Pakeha	44196	407475
	Māori	13282	141368
	Pacific	7933	54421
	Other	12461	55762
Language at home	Non-English	8755	56937.5
	English	68374	438617

☐ Participants   ☐ Population

0%   20%   40%   60%   80%   100%

Illustrating Credible Sampling

This figure shows the proportion of students sampled in the English medium asTTle norming as a reflection of the total population for several school characteristics. The asTTle English-medium sample is approximately 16% across all Years 5 to 11, sex, ethnicity, and dominant language at home. The bars indicate the percentage of population sampled by asTTle, while the smaller number indicates the number of individuals in the sample, and the larger represents the balance of the population not in the sample. Several key points should be noted about the asTTle sample.

1. the sampling is not equal across school years. Generally, primary years are sampled more extensively than higher years; in the asTTle sample were 22.5% of Year 5-6 students, 21% of Year 7-8 students and 14% of Year 9-11 students. This means that student year must always be considered when inferences are made about overall student performance.

2. the sample is almost equally divided between boys and girls; clearly a reflection of population realities.

3. although the population of Pasifika and other ethnicities in New Zealand is smaller than that of Pakeha and Maori peoples, the asTTle sample clearly has a much larger proportion of students from those two groups. The over-sampling was done to ensure that a sufficiently large sample existed on which to base inferences about these sub-populations. However, it does mean that inferences about New Zealand national performance need to be adjusted to take into account this deliberate over-sampling.

4. based on a very rough estimate of the population where a language other than English is spoken at home, it would appear that the samples in asTTle are roughly equivalent.

5. when the sample is examined by subject tested the same pattern as per the national sample exists.

Thus, in all categories across all three subjects, the asTTle sample is large enough and sufficiently diverse on which to draw inferences about student population performance.

Teaching Resources

This section provides some resources for designing and carrying out systematic survey research.

The video interview material linked here is available on the Education University of Hong Kong's International Educator platform of resources aimed at doctoral students.

I was interviewed for that project in 2010-11 and they have been edited and made available as open-access. These are now on my YouTube channel.

1. Design a Survey: https://www.youtube.com/watch?v=bqJbxoYjK60 AND https://www.youtube.com/watch?v=9kCCCjG7zhY

2. ⓘ nalysing Survey Data: https://www.youtube.com/watch?v=huHMY4VjcK8

My academic research has led to the development of a number of survey tools, which I've uploaded on figshare.com. These include:

- Teacher Conceptions of <u>Assessment</u>

- Teacher Conceptions of Assessment-<u>Abridged</u>

- Chinese-Teacher Conceptions of <u>Assessment</u>

- Teacher Conceptions of <u>Feedback</u>

- Student Conceptions of <u>Assessment</u>

- Chinese-Student Conceptions of <u>Assessment</u>

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