ADAPTATION
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# *Liars, Damned Liars and Respondents*

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## About our speakers

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PRICING DECISIONS
THERE IS NO MARGIN FOR ERROR

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## *Introduction*

Over the past five years our industry has made, at times, heroic efforts to adapt to the new online world. We are steadily moving away from "intrusive" face-to-face and telephone interviewing to “opt in” online panels. While in the early days we were bullish about the exciting possibilities of truly interactive experiences for respondents, in the main we as an industry have adapted to the online world through minor modifications of the procedures used for phone and self-completion studies, with a major focus on reducing data collection costs.

Despite the frequency with which we conduct online interviews there is no shortage of scepticism about the quality of data provided by online respondents. Much of this scepticism is due to how we recruit panellists – we have replaced the intrusive foot-in-the-door methods of traditional fieldwork with opt-in cash-for-comment panels. Even experienced online researchers can harbour fears about legions of spotty teens giving their thoughts on financial services in return for pocket money.

In this paper we discuss:

- Why we should be sceptical about the honesty of online data.
- How the industry usually deals with lying.
- What we mean by “lying”.
- Types of lie tests.
- Evidence we have collected relating to lying.
- Findings.
- Conclusions.

## *Why we should be sceptical*

Somewhat reassuringly, providers of online panels provide some data suggesting the veracity of their panels. In particular, they demonstrate that their panels contain key demographic groups (e.g., the elderly, the poor and the wealthy) and that the brand choice histories of online respondents are surprisingly close to brands’ market shares.

Nevertheless, the scepticism regarding the quality of online respondents is, in our experience, justifiable, as:

- Many respondents lie. In one study, we found that 64% of respondents admitted to “giving some nonsense answers” in some studies – such an answer suggests that at least 64% of respondents lie (Table 1 provides additional statistics suggesting that we should be concerned about the quality of data collected in online studies). Furthermore, as respondents, the two authors of this paper have felt compelled to lie from time to time

due to the impossibility of completing some questionnaires (we define "lie" below).

- Few researchers in Australia are actively testing for lies. We know this both from discussions with panel providers and from our experiences as online respondents.

- For obvious reasons, suppliers will not advertise their failures.

| % | Some studies are like this… |
|---|---|
| 79 | Seeming to encourage you to give some incorrect or poor quality answers |
| 75 | Asking you about things that you did not know much about |
| 66 | So bad that they encourage you to figure out the fastest way to complete them |
| 64 | So bad that you end up giving some nonsense answers just so you finish |
| 55 | Filled with mistakes |

**Table 1. Attitudes to online studies**

- The panel providers' studies which demonstrate the close fit between online respondents' brand buying and brands' actual market shares is less then compelling evidence against lying. In particular:

    - The demographic profiles of most brands in a product category do not differ.[1] Consequently, even if a sample has enormous demographic skews caused by people telling lies when providing demographics we should still expect that the brand shares will appear approximately correct.

    - If people tell small lies, we will not necessarily notice much in the way of brand share discrepancies. For example, if we have a study containing a sample of 12 year old boys pretending to be housewives, they may very well answer the question "What brand of baked beans did you last buy" as "What brand of baked beans did you last eat". Such data is likely to closely parallel market share.

## *How the industry usually deals with lying*

As an industry we have some well-developed procedures for addressing lies and liars. Most researchers check that pre-recruited respondents are "on spec". We write screeners in full knowledge that some respondents lie when answering

[1] Ehrenberg, Andrew S. C. and Rachel Kennedy (2001), "There is no brand segmentation," Marketing Research, 13 (1), 4-7.

screening questions.[2] And, numerous "tricky" techniques have been developed for collecting data on socially sensitive topics.

The logic that underlies most market research approaches to lying – and the three common practices described in the previous paragraph – is the idea that *people will only lie when they have an incentive to lie.* This idea goes under the ponderous name of *epsilon truthfulness* in the economics sub-discipline of "game theory".[3]

## *What we mean by "lie"*

What do we mean by "lie"? Our definition is:

> *A lie is any response in a survey where the respondent would have given a substantively different answer had they had a better incentive to tell the truth.*

This definition includes everything on a continuum from intentionally misleading answers through to typographical errors. It is a broad enough definition that we can expect many and perhaps most respondents to "lie" when completing a questionnaire. However, by "substantively different" we mean that we are focussing on differences other than small movements in scale points. In particular, we ignore differences in the detail and quality of open-ended responses and minor changes in closed-ended responses (e.g., "Strongly Agree" versus "Agree" or failing to replicate all of the responses in an open-ended question).

While we note that the question of why respondents might lie is important, in this study we focus solely on the issue of lying in online studies, as the assumption of epsilon truthfulness predicts that lying may be common in online studies. Respondents seeking to maximise their earnings per hour, or "wage", have an incentive to lie when completing screeners in order to be eligible to receive remuneration, and they have an incentive to lie when completing surveys to ensure that they complete in a short amount of time. Fortunately, epsilon truthfulness provides an incentive for a degree of honesty – we can expect that respondents will seek to minimise the number of unnecessary lies in an effort to avoid being unintentionally screened out and for fear of being caught and losing their "job" as a respondent.

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[2] Glassman, Nanci A. and Myron Glassman (1998), "Screening Questions," Marketing Research, 1988 (Fall), 27-31.
[3] Cummings, Ronald G., Steven Elliott, Glenn W. Harrison, and James Murphy (1997), "Are Hypothetical Referenda Incentive Compatible?," The Journal of Political Economy, 105 (3), 609-21.

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## *Lie tests*

A "lie test" is any method developed to identify a lie. In broad terms, lie tests check for inconsistent responses, implausible responses and biases in questions and question ordering.

***Inconsistency**: Do respondents provide contradictory answers to questions?*
Examples include:

- Asking the same question twice in a questionnaire. Generally, this involves comparing the answers to identical statements "hidden" in one or more batteries of statements.
- Checking the consistency between respondents' answers and data collected independently of the study, obtained either from an establishment survey or some other database (e.g., a client database).
- Asking a question twice, but providing an incentive to ensure accuracy the second time.[4]

***Implausibility:** Do respondents provide answers that are inherently implausible?*
There are numerous different approaches that involve testing for implausibility, including:

- Looking for logically unlikely combinations of data. Polygraph tests look for improbable combinations of verbal and physical responses. Researchers sometimes look for improbably data, such as 18 year olds with high incomes and multiple children, [5] or surveys with business where the email addresses and the time-of-interview suggest that respondents are not at work when completing the interviews.
- Identifying respondents who have selected too few or too many of certain types of "rare" responses. [6] For example, respondents who often choose responses that other respondents do not select, such as having large repertoires of niche brands
- Assessing knowledge. Psychologists and psychiatrists use accuracy of knowledge tests to distinguish between psychotics and malingerers – malingerers claim an implausible number of exaggerated behaviours, visual hallucinations and thoughts of suicide.[7]

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[4] E.g., Bohm, Peter (1972), "Estimating Demand for Public Goods: An Experiment," European Economic Review, 3, 111-30.
[5] Carson, Richard T., Leanne Wilks, and David Imber (1994), "Valuing the Preservation of Australia's Kakadu Conservation Zone," Oxford Economic Papers, New Series, 46 (October), 727-49. contains consistency checks – Online Reference 2252
[6] Lanyon, Richard I. and Leonard D. Goodstein (1997), Personality Assessment (Third ed.). Sydney: Wiley.
[7] Lanyon, Richard I. and Leonard D. Goodstein (1997), Personality Assessment (Third ed.). Sydney: Wiley.

- Identifying respondents with patterns in their responses,[8] such as if a respondent always says "Strongly agree" or cycling through different answers (e.g., A, B, C, D, C, B, A, B, C, etc.).
- Checking that the respondents have spent enough time answering a question to provide a sensible answer.
- Checking for preference intransitivity. An example of preference intransitivity is if a respondent likes product A more than B, B more than C and C more than A. This approach is used in Adaptive Conjoint Analysis.[9]

***Assessing question and question order bias:*** *has the question(naire) been written in a way to encourage lying?* In addition to the obvious types of biases, economists will assess whether a question is *incentive compatible* or not.[10] Basically, a question is incentive compatible if it provides an incentive for respondents to be untruthful. Many simple pricing questions are not incentive compatible. For example, the clever respondent should generally answer "No" to the question: "If brand X costs an extra 10c, will you keep buying it?". (None of the tests described in our studies below involve assessing question and question order biases).

Notwithstanding the frequent reports in the media to the contrary, most lie tests, including polygraph tests, are unreliable.[11] There are often quite benign explanations for what appear to be lies. Inconsistency in responses may reflect honest mistakes. Tests of implausibility can ignore that the world contains some highly unlikely people. Furthermore, researchers' technical mistakes and poor assumptions can cause "false positives". And, luck and respondent cleverness can lead to "false negatives". The consequence of the limitations of lie tests is that we need to be quite cautious in our decisions regarding whether respondents are providing honest answers or not. Nevertheless, for the sake of clarity we apply the harsh label of "liar" to any respondent who fails a lie test.

## Evidence

We have conducted eight online studies that explicitly addressed issues related to responding lying. Two of these studies have been self-sponsored, with primary objectives being to learn more about lying. The findings that we present in the next section have been drawn from all eight studies. However, with the exception

[8] Carson, Richard T., Robert C. Mitchell, Michael Hanemann, Raymond J. Kopp, Stanley Presser, and Paul A. Ruud (2003), "Contingent Valuation and Lost Passive Use: Damages from the Exxon Valdez Oil Spill," Environmental and Resource Economics, 25 (3), 257-86.
[9] Sawtooth (1996), "ACA System." Version 4.0 ed. Sequim: Sawtooth Software.
[10] Cummings, Ronald G., Steven Elliott, Glenn W. Harrison, and James Murphy (1997), "Are Hypothetical Referenda Incentive Compatible?," The Journal of Political Economy, 105 (3), 609-21.
[11] Lanyon, Richard I. and Leonard D. Goodstein (1997), Personality Assessment (Third ed.). Sydney: Wiley.

of Table 1, any numbers that are provided come from a study of 517 main grocery buyers conducted in the middle of this year. Table 1 is from a study of 219 Victorian MGBs with young families.

## *Findings*

### Finding 1: Lying is common

The great majority (83%) of respondents failed at least one of the lie tests. On average, respondents failed 2.1 lie tests.

### Finding 2: There are few compulsive liars

A natural tendency when thinking about lying is to think in terms of segments, where there is a segment of liars and another segment containing good, honest folk. However, an alternative perspective is that there are no segments of liars; rather, all people may have a tendency to lie.

If we assume that all people have a basic tendency to lie and that different "random events" determine whether or not somebody fails a particular lie test we can use statistical theory to make predictions about the distribution of dishonesty within a sample. If we assume that lying is a Poisson Process (this is a technical assumption which the reader does not need to understand), knowing that the average respondent failed 2.1 lie tests allows us to make a number of predictions:

- Prediction 1: 12% of respondents will fail no lie tests. In our study we observed this to be true of 17% of respondents.

- Prediction 2: 6% of respondents will fail six or more lie tests. In our study we observed that 9% of respondents failed six or more lie tests.

Figure 1 shows the proportion of respondents to fail different numbers of lie tests and the proportion that we would "expect" given the assumption that all respondents have a tendency to lie and it is only "random events" that determine when they lie.

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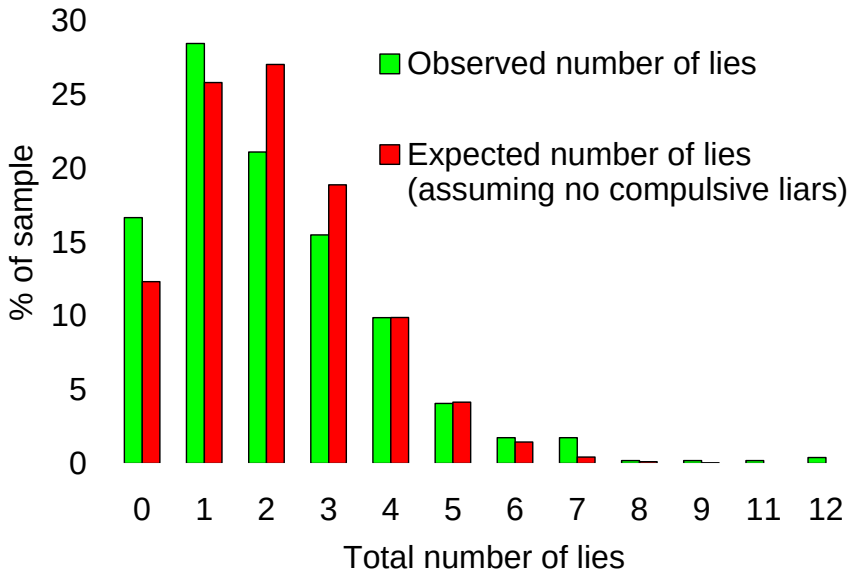


**Figure 1. Observed and expected number of lies**

If we examine Figure 1 and the two predictions discussed above we can see that there are a few discrepancies between the observed and expected (i.e., predicted) distribution of lying.[12] However, on the whole, the differences are small with the "expected" results closely mirroring the actual results. This suggests that in broad terms the theory about there not being a segment of "liars" per se seems to be correct (although there are clearly a few compulsive liars – such as the two respondents who failed 12 of the lie tests).

Other analyses we have conducted confirm the conclusion that there are few compulsive liars, rather, people lie in particular circumstances. Our company's interest has focused on how observed lying affects the quality of data in choice models.

In one study we identified that about a third of respondents had lied, either through completing the survey in an improbably short amount of time or by failing to demonstrate accurate category knowledge and response consistency. These liars were found to both be less price sensitive than the honest respondents, to have selected alternatives in the choice model based on the position of the alternatives of the screen (with little evidence that they scrutinised the various alternatives that they were presented), and to contain a surprisingly high proportion of male main grocery buyers.

[12] These differences are significant at the 0.05 level.

In another study we found that that level of "noise" in choice modelling data was completely independent of respondents' number and types of lies.[13] The key difference between this study and the previous study was that in the study where lying caused problems, the liars had lied in the screener, meaning that they did not have the knowledge to provide meaningful answers about the category. By contrast, in the study where we found no relationship between the lies and the choice modelling data, the lies were unrelated to the topic of the choice model.

These two studies reinforce our general finding that the problem is one of lying, rather than liars. This means that standard questions at the beginning of the survey trying to catch "liars" will generally not be fruitful. Instead, if people lie on a case-by-case basis we need to address lying on a question-by-question basis.

### Finding 3: Lie tests differ in their sensitivity

For example, we found that 25% of canned vegetable buyers thought they had purchased Dolmio canned vegetables (presumably a false positive based on brand familiarity), whereas only 2% had purchased Tim's Extra ground coffee. Similarly, we found that only 2% of people strongly agreed that "I never worry about anything", whereas 19% strongly agreed with the statement: "I have never stolen anything".

### Finding 4: People lie if you give them a reason

Our study commenced with two rotated questions that were designed to look like screeners. One of these questions asked "Have you bought Sensodyne toothpaste in the past three months". Although the brand is a niche product with a 2.5% market share, 27% of our respondents claimed to have purchased the brand. Our other fake screener related to age. We knew respondent age from the panel's establishment survey. We asked people a question which we knew that if honestly answered they would reply "No". For example, if somebody was aged between 35 and 44 we asked them "Are you aged between 18 and 34". One-in-five (19%) of the respondents lied, even though they presumably knew that the answer might contradict data they had previously supplied.

### Finding 5: Lies are opportunistic, not pathological

Fortunately, the proliferation of lies that occurs in screeners does not occur in the body of the questionnaire. In our study we collected repertoire (buy "time to time") for 20 different product categories. In general, the repertoire information was

[13] We tested this in two ways. First, we estimated a heteroskedastic multinomial logit model, where the scale parameter was a function of the specific lie tests. Second, we estimated a concomitant finite mixture model where component size was a function of the results of the lie tests. Neither of these models was statistically superior to comparable models not employing the results of the lie tests.

closely in line with market share, demonstrating that the lies in the age and Sensodyne screeners almost certainly arose due to respondents feeling that they needed to lie in order to qualify for the study. The following are examples of the incidence with which a variety of different brands were reported to be purchased (the corresponding market share of the brand, as reported in *Retail World*, are shown in the brackets):

- 78% Colgate toothpaste (63% market share)
- 62% Duracell batteries (40% market share)
- 48% Lipton tea (19% market share)
- 64% McCormick herbs/spices (17% market share)
- 33% Omo laundry powder (14% market share)
- 17% Duo laundry powder (7.1% market share)
- 10% Lux soap (6.2% market share)
- 5% Bushell's Instant Coffee (2.7% market share)
- 4% Rocket batteries (2.6% market share)
- **27% Sensodyne tootpaste (2.5% market share)**
- 10% White Glo toothpaste (1.5% market share)[14]

It is quite apparent that the proportion to say "Yes" in the Sensodyne screener is out of all proportion to the brand's market share. The relatively high number for White Glo is perhaps attributable to respondents knowing they need to be careful when answering questions about toothpaste.

## Finding 6: People are less likely to tell "small" lies (than "big" lies)

In the age screener, described above, we observed that:

- 68% of respondents who were only one year too old to be able to answer "yes" honestly actually lied.
- 28% of respondents who were only two years too old lied.
- 10% of respondents who were three or more years too old lied.

Our interpretation of this finding is that many of the respondents who lied about their age did so under the belief that they were telling something of a "white lie"; as they had recently been in the relevant age group they thought their opinions would be representative enough for the needs of the research. Also, the 10% of respondents who lied who were three or more years too old may well have lied in the establishment survey (which collected age as an open-ended question).

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### Finding 7: Liars try to lie consistently

In the Sensodyne screener we observed that 27% of people lied. When giving their repertoires for the category, 27% of people included Sensodyne. Eight-in-ten (82%) of the respondents to have said "Yes" to Sensodyne in the screener mentioned it when indicating their repertoire of toothpaste brands. While it is possible our Sensodyne lie test is prone to more false positives than we would anticipate, our interpretation of this finding is that the respondents were actively ensuring that their lies were consistent.

## *Conclusions*

When we embarked on this field of study we feared that we would prove online research to be of little or no value. Fortunately, we have instead concluded that the problem is one of lies, not liars, and the problem is manageable. Furthermore, as lying seems to relate more to the specific question that is asked than to the intrinsic willingness of certain people to lie, we are of the belief the addressing lying needs to be a matter for researchers and not panel providers.

More specifically, our research suggests that we need to be vigilant about the possibility of lies when writing questionnaires and when analysing data. In particular, we need to:

- Use multiple lie tests (as they differ in their sensitivity).
- Improve the screeners used in online studies. We need to abandon obvious screeners (such as those tested in our study) and use lie tests. We are of the opinion that the best lie tests for screeners will contain tests of category knowledge (rather than just consistency in responses).
- Avoid asking tiring questions which encourage lying (such as large grids).
- Avoid giving any clues to respondents about which questions are likely to be used for screening in particular and skips in general.
- Focus on relativities when analysing the data. As most questions seem to suffer from lying, the reality is that we will have numerous lies in our data, so we need to conduct analyses that are fairly robust to the resulting high levels of "noise".
- Over-recruit studies so that we can delete liars.
- Communicate to clients that we are addressing lying.