Assessing the Acquiescence Bias of Online Research Data

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Abstract

The impact of acquiescence bias in online samples is real and deserves serious research attention. This paper assesses the impact of acquiescence bias of online respondents on research output. Specifically, this paper addresses one type of acquiescence bias being increasingly observed in online panel rating scale data, where respondents exhibit low variability across rating scale items. This type of acquiescence bias is defined as *flat line response bias* in this study. The insidious effects of flat line response bias will be demonstrated on market segmentation and structural equation modelling in the context of a brand equity framework. This paper urges the market research industry to improve online recruitment and management to reduce flat line response bias in online panel surveys.

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Introduction

As a profession, marketing research needs to be able to measure consumer attitudes and behaviour validly. Despite the rapid migration to online data collection which has become the dominant market research methodology worldwide, surprisingly there has been little research into the biases contained in online panel samples.

Acquiescence bias is one such bias and refers to the propensity for respondents to agree or disagree with questionnaire items independent of their content (Messick and Jackson, 1961; Podsakoff *et al*., 2003; Winkler, Kanouse, and Ware, 1982). In the case of binary response data, acquiescence is also known as yea-saying or nay-saying. In this study we focus on the case of acquiescence of rating scale data, where respondents exhibit low variability across rating scale items. We define this type of acquiescence bias as *flat line response bias*.

The remainder of this paper is organized as follows: We first illustrate flat line response bias and contextualise the impact of the bias in light of a brand equity framework. Second, we discuss the data analysis which involves segmentation and the Erdem and Swait (1998) Brand Equity Framework using structural equation modelling. Finally, we discuss the implications of our research findings and discuss how best practice in online panel recruitment and management can reduce the likelihood of flat line response bias.

Flat Lining Response Bias

An easy way of detecting flat line response bias from online panel survey data is by examining within subject variation. If there is little or no variation within a respondent, the respondents are usually deemed to be flat liners. As an example, on a series of five positive Likert-type rating scales, ranging from one through seven, flat lining respondents would produce ratings similar to the invariance response pattern observed in Table 1.

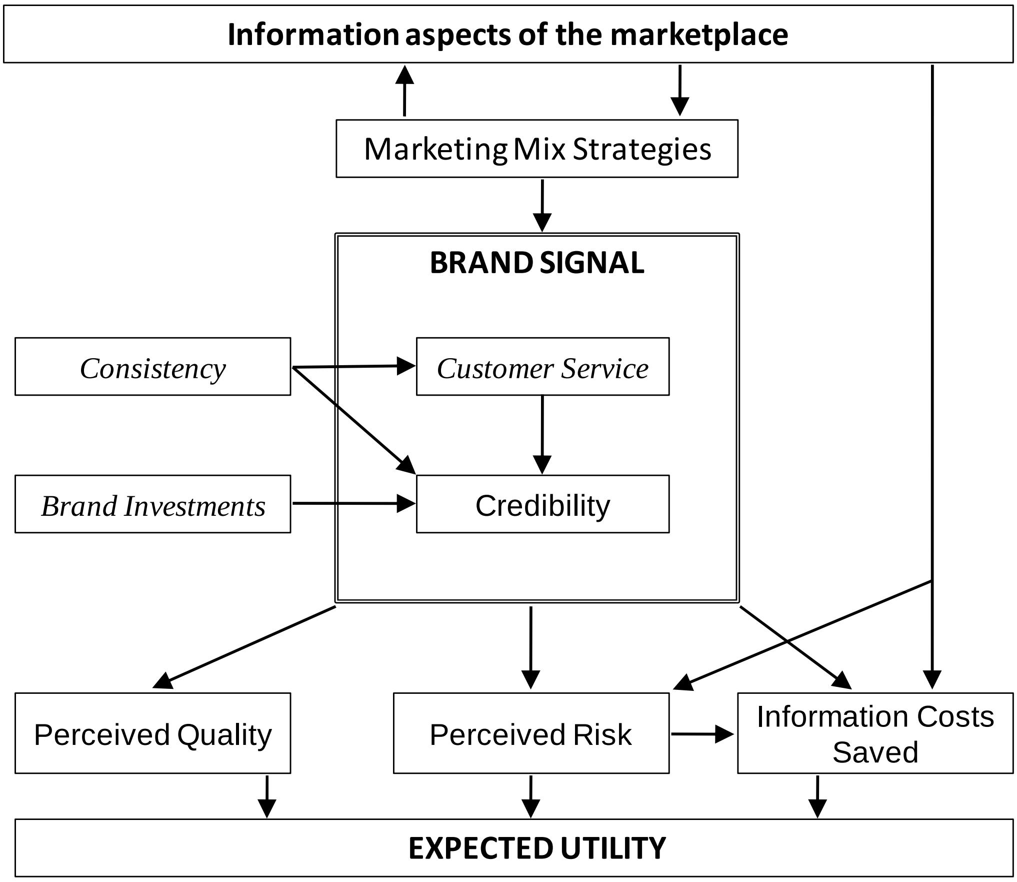
Table 1: Example of Flat Lining Respondents Using a 7-point Likert Type Rating Scale

Respondent ID	Rating Scale 1	Rating Scale 2	Rating Scale 3	Rating Scale 4	Rating Scale 5
1	5	5	5	5	5
2	6	6	6	6	6
3	7	7	7	7	7
4	5	5	5	4	5
5	4	4	4	4	4

In order to contextualise our discussions to a real market situation, we use real online data collected for a bank. The bank is one of the big three banks in Australia and it commissioned a study to measure its brand equity positioning relative to the competition.

A review of extant literature on brand equity indicates that three principal frameworks for understanding and measuring brand equity have emerged as dominant themes in academic marketing research over the past two decades. They include (1) Aaker's (1991) framework, which is a managerial view of brand equity; (2) Keller's (1993) psychological, memorybased view of brand equity; and (3) Erdem and Swait's (1998) brand equity framework based on information economics and signalling theory. Although there are other views of brand equity (Kapferer 1992), we focus the brand equity framework known as the Erdem and Swait Brand Equity Framework (1998) as depicted in Figure 1.

Figure 1: The Erdem and Swait (1998) Brand Equity Framework



The Erdem and Swait (1998) Brand Equity Framework uses signalling theory (Spence, 1974). Signalling theory is derived from information economics where markets are characterized by imperfect and asymmetric information (Stigler, 1961). Asymmetric information exists when one participating economic agent, e.g., a firm, knows more about their product than other agents, e.g., consumers. Imperfect information refers to a lack of complete information when evaluating product attributes (Nelson, 1970).

Imperfect and asymmetric information leads to uncertainty, which in turn influences consumers' perceptions of brand attributes. Uncertainty about product quality also suggests that consumer beliefs may vary from person to person on the aspect of quality. This creates consumer perceived risk, which is something consumers like to avoid. Risk-averse consumers are not comfortable with ambiguous and uncertain product quality assessments. When the quality is uncertain, consumers are likely to search for more information. Erdem and Swait (1998) argued that consumers can use brands as a signal for quality. Brand credibility is hypothesized to be the key antecedent or mediator to brand quality, brand perceived risks and brand information costs. According to Erdem and Swait (1998), higher perceived quality, lower information costs, and lower perceived risks associated with credible brands can increase the expected utility of that brand.

Data Analysis

The sample comprised 733 respondents that were customers of the bank and had an active savings account with the bank for at least 12 months. Respondents were solicited from the general population from a leading Australian online panel provider and incentivised accordingly to complete a 15 minute online survey.

In order to examine the likelihood of flat-lining, the means of each set of seven items for each brand equity construct were first derived for each respondent. The seven means were then used to compute the coefficient of variation (CV) for each respondent as a standardized indicator of flat lining responses. A high CV indicates variability in responses between items, whereas a near zero CV indicates flat lining response behaviour. A distribution of the CV values is shown in Figure 2.

Figure 2: Distribution of CV

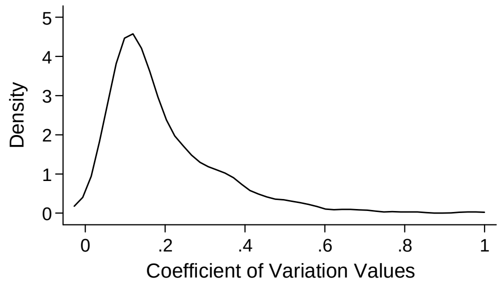
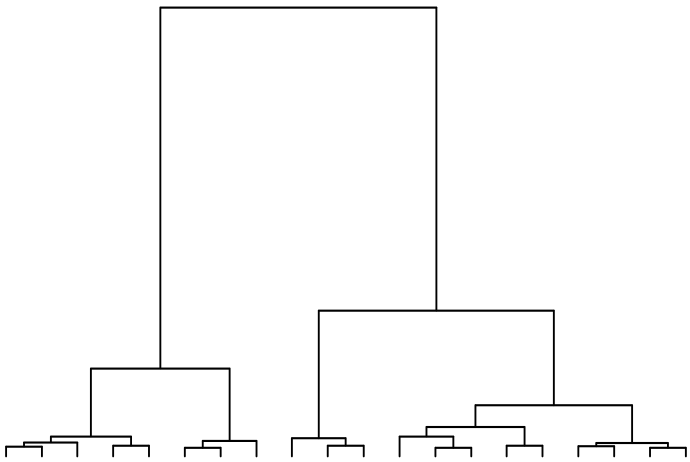
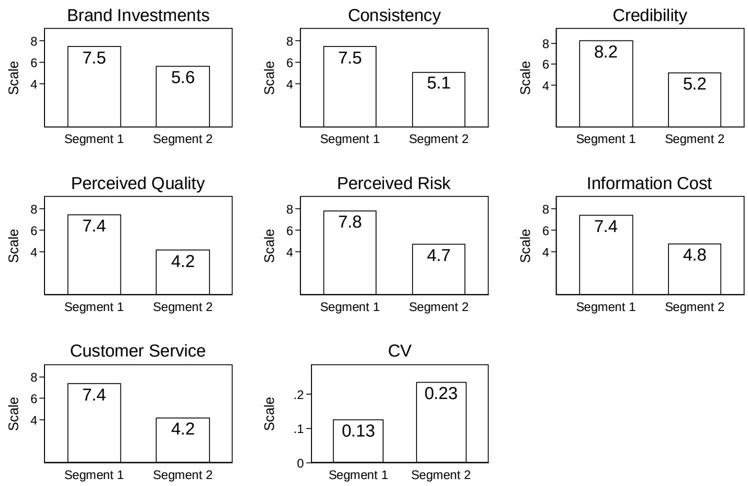


Figure 3: Dendrogram for Clustering the Brand Equity Construct Means



A Wards hierarchical cluster analysis was then conducted on the construct means to determine the optimal cluster solution. The dendrogram in Figure 3 shows a two cluster solution. Segment 1 exhibits a low CV mean of 0.13 suggesting flat lining respondents and Segment 2 exhibits a higher CV mean of 0.23 suggesting non-flat lining respondents (Figure 4). As shown in Figure 4, Segment 1 exhibits a uniformly higher mean for each of the seven brand equity constructs than Segment 2.

Figure 4: Brand Equity Construct and CV Means by Segments



Upon further examination of the response patterns between the two segments, we noticed that Segment 1 comprised flat lining responses. A subsequent independent sample t-test confirmed that Segment 1 CV mean (0.13) is significantly lower than Segment 2 (0.23; $t = 11.09$; $df = 731$; $p < 0.0001$). This shows the harmful impact of flat line response bias on the segmentation, which is arguably the most popular market research and marketing tool in use today.

To shed more light on the two segments, we profiled each segment according to demographics. Flat lining respondents in Segment 1 when compared to Segment 2 tended to be either young (<24 years) or old (65+ years) and female, and were not likely to be in full time employment. Segment 1 respondents also tended to have lower incomes (<$75,000 p.a.) rather than higher incomes (>$75,000 p.a.), with a high likelihood of internet connectivity. They consistently claimed a high level of brand or product knowledge, most likely because they were extremely active panellists (i.e., members belonging to 7+ online panels) most likely chasing survey incentives.

We next compare the Erdem and Swait (1998) Framework via maximum likelihood structural equation models for the complete and the non-flat line sample. Table 2 shows the squared multiple correlations (SMCs) for the five endogenous brand equity constructs.

Table 2: SMCs of Endogenous Brand Equity Constructs

Models	Credibility	Perceived Quality	Perceived Risk	Information Costs Saved	Expected Utility
(A)	0.87	0.94	0.91	0.74	0.88
(B)	0.68	0.85	0.79	0.42	0.82
Difference	0.19	0.09	0.12	0.32	0.06
Difference %	27.94%	10.59%	15.19%	76.19%	7.32%
Note: (A) = Complete sample; and (B) = Exclusion of flat line respondents.					

Table 2 shows large differences in SMCs between the two models. For the complete sample we see that the SMCs are inflated because they included flat liners who tended to provide consistent values across the constructs. This is a misleading artefact of the flat line response style bias. It can be seen that the SMC for the information costs saved construct is alarmingly high for the flat line removed sample when compared to the complete sample. These construct items require higher cognitive effort to process, and in the case of flat lining respondents who were seeking to speed through the rating scale items by expending minimum cognitive effort, they artificially inflated the SMC. To a lesser extent, though still of concern, is the credibility construct which also requires higher cognitive effort to be expended in the underlying rating scale items. In the case of the expected utility construct where the items were the easiest to cognitively process, the difference between the complete sample and the flat lining removed sample is similar. Without controlling for the response style bias, the client would have been provided a rosier picture than reality, thereby misleading the client.

Discussions and Conclusions

The impact of flat lining respondents in online samples is real and deserves serious research attention. We have demonstrated the insidious effects of leaving flat lining respondents in the sample. As more people join online panels for economic, social and technological reasons, online panel providers should be more vigilant in their recruitment of online panel members.

Poor recruitment methods and poor online panel management are most likely to lead to high levels of flat lining respondents. We believe that this issue may be more prevalent than what clients or online panel research suppliers are aware of. Without building a quality control standard into the full market research process, we cannot control for flat line response bias. In this analysis we have observed that 38.06% of the complete sample flat lined. These respondents are upward biased and they should ideally be removed from the sample.

To the best of our knowledge and experience, at least 25% of each sample obtained online in either academic or applied settings suffers from the flat line response bias. To mitigate this problem, marketing research community should increase the quality of online panels and enforce industry standards such as the Association of Market and Social Research Organisations (AMSRO) guidelines for quality recruitment and online panel management. In Australia in particular, International Organization for Standardization (ISO) 26362 was taken to a higher level with Quality Standards for Online Access Panels (QSOAP) Gold Accreditation, which recognised the need for a Qualified Practicing Market Researcher (QPMR) to be directly involved in the end to end online research process. For an online panel company with ISO 26362 accreditation to be a qualified member of AMSRO, it also needs to meet ISO 20252 standard for market research. Therefore, we urge market research academics and practitioners to heed our call for more attention in this important research area. If online panel recruitment and management standards are not properly adhered to by online panel providers, our credibility as a market research profession will suffer in the long term.

We believe that we have demonstrated the need for marketing researchers to think about how data need to be analysed in order to provide valid information to clients. Online sample data need to represent the target population that is under study and account for response biases. We need to ensure that quality procedures are built into online panel recruitment and management. Therefore, we recommend that marketing research clients use online panel providers that are accredited with ISO 26362 and QSOAP Gold standards in order to minimise flat line response bias.

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