How the Order of Response Options in a Running Tally Can Affect Online Survey Estimates

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Abstract
In the design of online surveys, running tallies or constant sums are used to help respondents sum up the allocation of amounts so that the total sums to 100%.

We hypothesized that for time allocation, the order of the presentation of the time categories could make a difference in the distribution of reported time spent. We expected primacy effects, with the first-presented time category having a higher allocation of time than the later-presented options.

An experiment was conducted with a general population adult sample from KnowledgePanel®. In the experiment, respondents were asked to provide running tallies of the percentage of television they typically watch during the morning, afternoon, and evening (separately for weekdays and weekends). The order of the categories was rotated. Primacy effects were detected, however differences by position were small and not statistically significant. Because time spent watching TV is a regular activity, viewing patterns are more likely to be encoded or ingrained in memory, and more likely to be reported reliably, with responses less susceptible to order effects.

Key Words: Running tally, constant sum, primacy effects, experiment

1. Introduction

In online surveys, running tallies or constant sums are used with series of number boxes to help respondents sum up allocations of amounts so that totals sum to 100%, 24 hours, etc. The cumulative total can be displayed on screen and updated as numbers are successively entered. This is a feature unique to online surveys.

Conrad et al (2009, 2010) conducted experiments to investigate this type of item, which provides the respondent with instant feedback, and found that it increases the amount of well-formed and accurate responses (at least among non-professional respondents).

In this paper, we also conduct experiments with running tallies, but our focus is on order effects. We hypothesize that the order of presentation of time categories could make a difference in the distribution of reported values. We expect to observe primacy effects, with the first-presented time category having a higher allocation than later-presented options.

To our knowledge, there is very little previous research on the performance and properties of running tallies, and no research on primacy effects with running tallies.

2. Methods

In order to test for primacy effects with running tallies, we conducted an experiment with a sample of online adult panelists from KnowledgePanel -- the probability-based, online panel maintained by Knowledge Networks.

In the experiment, respondents were asked to provide running tallies of the percentage of television they typically watch during the morning, afternoon, and evening. Information was collected first for a typical weekday and then for a typical weekend. The order of the three time periods was rotated. Respondents were prompted for sums that did not equal 100%. This information was collected in a survey fielded in August 2010 and was completed by 2,098 panelists (representing a 66% completion rate). Figure 1 presents the actual question wording from the KnowledgePanel survey.

Figure 1. Survey Question

Of the television that you watch on a typical (weekday/weekend day), what percentage do you watch during the following time periods?

Please type a whole number in each box below. Please make sure your total equals 100%.

Morning (12 midnight to 12 noon)	_____%
Afternoon (12 noon to 6 PM)	_____%
Evening (6 PM to 12 midnight)	_____%
Total	**[SUM]%**

3. Results

Observed percentages from the KnowledgePanel experiment are presented below, in Tables 1 and 2. For both weekdays and weekends, panelists report that the vast majority of TV watching is done in the evening. Distributions between weekdays and weekends are relatively similar, although a slightly higher percentage of television is viewed during weekend afternoons.

Table 1. Reported Television Watching, Percentages by Time of Day

Of the television that you watch on a typical (weekday/ weekend day), what percentage do you watch during the following time periods?	Weekday	Weekend day
Morning (12 midnight to 12 noon)	14.2%	14.5%
Afternoon (12 noon to 6 PM)	18.7%	23.5%
Evening (6 PM to 12 midnight)	67.2%	62.0%
Total	100.0%	100.0%

In Table 2, we reorganize the distributions by order presented in the survey. We see that percentages are highest for the category presented first and lowest for the category presented last. Primacy effects are detected, however differences by position are small and are not statistically significant. Percentages are very close to 33.3%, which we would expect to observe in the absence of order effects.

Table 2. Reported Television Watching, Percentages by Position

Of the television that you watch on a typical (weekday/ weekend day), what percentage do you watch during the following time periods?	Weekday	Weekend day
Position 1	34.6%	33.7%
Position 2	33.1%	33.7%
Position 3	32.3%	32.5%
Total	100.0%	100.0%

In Table 3, results have been reorganized and rescaled for ease of presentation. Weekday and weekend data have been combined. Percentages reported in position 2 and position 3 are expressed relative to percentages reported in position 1 – the reference category, with a scaled value set equal to 1. For each time category, decreases by position are observed, although the magnitude of the decreases are small. Based on Z tests of proportions for independent samples, none of the differences are shown to be statistically significant.

Table 3. Rescaled Results for Reported Television Watching

	1st position	2nd position	3rd position
Morning	1	0.94	0.89
Afternoon	1	0.96	0.95
Evening	1	0.99	0.97
Average	1	0.97	0.94

4. Discussion

In this experimental work on running tallies and primacy effects, we find the first-presented time category receives a higher allocation than later-presented options. However, the observed primacy effects are small and do not attain statistical significance.

Because time spent watching TV is a regular activity, viewing patterns are more likely to be encoded or ingrained in memory, and likely to be reported reliably, with responses less susceptible to order effects. An examination of the raw data shows that respondents report round numbers that easily sum to 100% (30%/30%/40%; 10%/20%/70%; 25%/25%/50%, etc.). It appears that this was not a particularly difficult cognitive task for respondents.

In a similar running tally experiment, conducted with 524 KnowledgePanel respondents in January 2011, differences in time allocations by position were once again shown not to be statistically significant.

Running tallies are survey items unique to online surveys. However, not much research has been conducted on this type of item. This research on primacy effects is our small contribution to better understanding the performance and properties of this type of item and we welcome additional research on this.

References

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