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IMPACT OF LOTTERY INCENTIVE ON RESPONSE RATE AND DATA QUALITY: EVIDENCE FROM ORGANIC FOOD CONSUMPTION SURVEY OF CONVENTIONAL SHOPPERS

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ARTICLE DETAILS	ABSTRACT
<i>Article History:</i> Received 17 June 2021 Accepted 02 November 2021 Available online 05 November 2021	Incentives of different forms and at different stages are used for motivating people to participate in human subject research. Although it is widely accepted that incentives, in general, play a positive role in increasing participation rate and are widely used, there are exceptions that they may not increase response rate and may even contaminate the quality of data resulting in poor research findings. This study examines the impact of pre- and post-disclosed committed lottery incentives on response rate and data quality in a face-to-face survey of conventional consumers for organic food consumption. A survey was conducted at the premises of four conventional grocery stores in Edmonton, Alberta, Canada. Half of the randomly approached and agreed upon respondents were disclosed the lottery incentives at the beginning, and the rest half were told at the end. Data quality was measured using three indicators – edit occurrences, imputation occurrences, and proportion of incomplete answers. Our study finds little difference in response rate between pre- and post-disclosed lottery was significantly higher than those of pre-disclosed. Our study also shows that people with likings of organic food and buying organic food more frequently are likely to offer a better quality of information.
	KEYWORDS

Face-to-face survey, data quality, lottery incentive, organic food consumption

1.INTRODUCTION

Incentives to increase response rates in survey research have been around for over a century. Studies on the impact of such incentives on response rate, data quality, and cost-effectiveness have also been followed closely. In 1930, a study in New York found that a 25-cent incentive in a mailed survey increased the response rate from 19.1 to 51.6 percent, a difference of 32.4 percent (Shuttleworth, 1931). Such an increase in response rate (nearly 170 percent) did not identify a decrease in data or response quality but increased cost substantially, leaving the decision to the individual researchers on how much an appropriate incentive amount should be. Numerous experiments have been conducted since then to determine the effectiveness of incentives, along with the appropriate method, amount, and time of incentives to increase response rates primarily for mail surveys (Cannell and Henson, 1974; Hansen, 1980; Shaw et al., 2001; Koloski et al., 2001; Trussel and Lavrakas, 2004; Eyerman et al., 2005; Kulka et al., 2005; Wright et al., 2005; Kanaan et al., 2010; James et al., 2011). Similarly, incentives to increase response rates on telephone surveys under different circumstances were also studied (Gunn and Rhodes, 1981; Singer et al., 2000; Knoll et al., 2012) with varying results. Recently, with the advent of internet survey tools, such experiments were conducted on web-based surveys as well (Cobanoglu and Cobanoglu, 2003; Porter and Whitcomb, 2003; Deutskens et al., 2004; Goritz, 2006; Sánchez-Fernández et al., 2010; Dykema et al., 2012; Kennedy and Ouimet, 2014; Meuleman et al., 2018; Coryn et al., 2020; Stanley et al., 2020; Knowles and Stahlmann-Brown, 2021). However, studies on increasing response rate and data quality in face-to-face interviews are relatively scant, especially for a committed lottery incentive. This study tries to fill that gap in the literature by sharing the experience of a survey of conventional shoppers regarding organic food consumption and purchasing behavior.

The effect of prepaid monetary and nonmonetary incentives in face-toface interviews on response rates and response quality was studied before. A simple incentive of a ball-point pen significantly increased response rate in a face-to-face survey with little impact on data quality (Willimack et al., 1995). Data from U.S. Census Bureau's Survey of Income and Program Participation (SIPP) in 1996 with variable incentives to different respondents (\$0 for 51%, \$10 for 24%, \$20 for 25%) to examine the impact on data quality as measured by (1) edit occurrences, (2) imputation occurrences, and (3) overall completeness of the household reference person's record (completion index) suggest that incentives did not affect data quality in terms of the number of responses that are imputed, inconsistency in response, or interview break-offs (Davern et al., 2003). The effect of committed or conditional incentives for face-to-face surveys is lacking in the literature. The only study we found that addressed the lottery payment on the effect of response rate is a large study in Germany (Pforr et al., 2015), where lottery payments were found to be less effective in increasing response rate than cash incentives. However, cash incentives are more costly than lottery incentives, and researchers must weigh the trade-offs between the two. Although studies on the effect of committed incentives in the form of the lottery are rare for face-to-face

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surveys, a few of such studies are available for email and mail surveys (Porter and Whitcomb, 2003; Halpern et al., 2011), and internet surveys (Knowles and Stahlmann-Brown, 2021).

In this article, we plan to share the experience we gathered on a committed incentive through lottery while conducting a face-to-face interview on consumers' demand for organic foods. The main questions we would like to answer are the following: Does a pre-disclosed lottery payment increase motivation to participate in a face-to-face survey? Does the response rate vary among shoppers of different ethnic groups? Are there any differences in data quality between pre-disclosed and post-disclosed lottery payments? Is the data quality affected by the characteristics of respondents?

The remainder of the paper is organized in the following sections. The next section offers a brief review of the impact of incentives on response rate, followed by a section on the effect of incentives on data quality. Section 4 presents literature on data quality in face-to-face surveys. Section 5 details the methodology we followed, and Section 6 presents results and discussion. We summarize the results and offer a conclusion in Section 7.

2. INCENTIVE ON RESPONSE RATE

Incentives in survey research have been common primarily to increase response rates and decrease nonresponse bias. However, ambiguity remains on the impact of response rate, especially on the nature of the relationship between the amount of incentive and change of response rate. By and large, the consensus is that incentives increase response rates if these are monetary and prepaid. The conclusion, however, is far from being unanimous. Not all incentives are equally effective – some are more, some are less, and some are ineffective. Similarly, not all respondents react in the same way. Some may find an incentive persuasible, while others may find the same incentive inconvincible or even as a form of provocation. Nearly a century ago, it was observed that an incentive is not necessary, only a minor improvement with incentives, a 25-cent coin to increase response rate by only 14 out of 314 respondents (Shuttleworth, 1931). Some researchers think incentives may contaminate true findings through the incorporation of bias (Goritz, 2010).

The underlying economic assumption behind monetary incentive is to compensate for the time spent and the effort made to provide the information, and an incentive is expected to make a positive contribution at least in increasing response rate. Although it is argued as an example of social exchange theory [rather than economic exchange], meaning that the researchers willing to receive greater participation should offer an incentive (something of value) for the respondent's participation establishing an explicit social exchange relationship, this is indeed an economic relationship - as a measure of compensation (Dillman, 1991; Davern et al., 2003). Such incentives could be monetary payments, gifts, lotteries, or reports of the research project, which recompense the respondents for time and effort and motivate them to participate. Some respondents may get motivated due to social exchange and may not need monetary incentives. Social exchange is a voluntary action of an individual motivated by social returns that are expected to bring (Blau, 1964). The key here is 'voluntary' and intrinsic motivation as it is different from economic transactions, although the focus may seem on some extrinsic benefits. There are three ways that incentives may work. These are 'cognitive exertion' - an increased amount of thought put into the response, 'motivational focus' - a change in the goal to respond, and 'emotional triggers' - an increased inclination toward providing a response (Read, 2005).

The practice of providing incentives is not without controversy. Particularly, if the gathering of information is for the greater good of the society and the respondent is already intrinsically motivated, there is no need for an incentive. Several studies report that an intrinsically motivated respondent finds the incentive demeaning, resulting in a counterproductive outcome – a crowding out of the response rate (Frey and Oberholzer-Gee, 1997; Grady, 2001). This is due to the altruistic nature of human beings – a charitable behavior motivated by selfless concerns for the benefit of others or to the community. Whether an incentive stimulates or crowds out such behavior varies from one person to another, one society to another, and one time to another. The explicit incentive for motivation may come into conflict with other motivations, especially intrinsic motivation (Gneezy et al., 2011). If a monetary incentive is offered, the respondent may perceive the objective of the research differently, resulting in a negative attitude toward participation.

Whether an incentive is effective or not depends on the situation – the purpose of data gathering, presentation of that to the prospective respondents, the amount, type, and time of incentives, and the amount of

time and effort required from the respondents. The willingness to participate as a research subject comes from two different types of motivations – intrinsic and extrinsic. Intrinsic motivation arises from one's inside, either as a civic responsibility or charity or as a contributor to the public good from which the society is expected to benefit. This is an altruistic reason or the expression of philanthropic behavior. An individual may become motivated to participate as a research subject simply to contribute to the findings of the research. In such a case, an extrinsic motivation through monetary incentive may convey a counterintuitive message and may turn the altruistic behavior off, resulting in a lower possibility of participation. There are also individuals who would like to receive incentives but not in public. Public incentives may reduce their image problem and can demotivate them.

3. INCENTIVE ON DATA QUALITY

Studies on the effect of incentives on data quality primarily focus on the effect of individual behavior or the socio-economic characters of respondents. Most studies report that incentives have little impact on data quality (Shettle and Mooney, 1999), although there are studies reporting positive effects for less-educated and lower-income respondents (Arzheimer and Klein, 1999). It has been observed in an earlier study that either an incentive does not affect data quality or the reduction of nonresponse bias through increased response rate balances the disturbance of incentive (Shuttleworth, 1931). Others could neither confirm nor reject the incentive susceptibility of data quality for socioeconomically deprived respondents in Germany (Pforr et al., 2015). In the same way, also in Germany, prepaid incentives in web surveys seemed to have no advantage concerning the willingness to participate, actual completion rate, and the share of incomplete response pattern when compared with postpaid incentives (Bosnjak and Tuten, 2003). However, incentives may increase response rates at the expense of data quality (Goritz, 2010). Individuals may complete questionnaires skipping questions, may give answers without sufficient thoughts, and may also lose intrinsic motivation for answering questions correctly although there are claims that that "people who are rewarded for their participation would continue to give good information" (. Singer, 2002). One possibility of incorporating bias affecting data quality is from the fact that an incentive may attract a particular category of respondents if the incentives are disclosed before the interview or are prepaid. However, such an assertion is not without a challenge. Although little evidence may be found on the item nonresponse across the incentive groups, results may indicate that sequential incentives reduce bias and increase sample representativeness by incorporating individuals with a lower likelihood to participate, which is a tendency of improving data quality (Dykema et al., 2020).

Measuring and comparing data quality among survey modes are complicated. Although seemingly in agreement with the concept among most researchers, the metrics and indicators of data quality have a wide range. Data quality is referred to as the accuracy of data - meaning the metrics of response bias or response error (Stecklov et al., 2018). Item nonresponse rates can also be used as an apparent sign of data quality (Singer et al., 2000) although use of errors in survey response can be an indicator of data quality. Incentives, in general, are beneficial for improving participation and thus lowering errors in household surveys (Singer et al., 2000; Hsu et al., 2017; Stecklov et al., 2018). There can be three indicators to measure data quality. These are the number of editoccurrences (the frequency of changing, modifying, or altering answers), imputation occurrences (imputed from the respondent's implied answers), and overall completeness (Davern et al., 2003). Aside from these, skipping questions, missing questionnaires, and completion of survey questions are indicators of data quality (Cole et al., 2015). Similarly, the proportion of completion with item nonresponse, the average length of the response of open-ended questions, and the average amount of time to complete the questionnaire may also be the metrics of data quality (Stanley et al., 2020). Again, incentives were found to have a minimal effect on data quality and nonresponse bias.

Incentives may contaminate the quality of response. An earlier study suggest that an incentive may make participants likely to provide a response that would please the researcher, rather than providing a valid or true answer (Cannell and Henson, 1974). In such a situation, individuals may become partially dishonest and provide aberrant information (Mazar et al., 2008). Although the responsibility goes to the individuals responding, the researcher becomes responsible for inducing this opportunity. Moreover, the research results become erratic. From a research perspective, incentives may create bias, although there are arguments against that. Financial incentives may make the sample skewed toward less-educated and lower-income individuals and, as such distorting the representativeness of the population (Ritter et al., 2005). Similarly, respondents with no incentive returned survey forms with more

complete and quality information relative to their counterparts receiving incentives and concludes that participants motivated purely for financial reasons would provide erratic and inaccurate information resulting in biased outcomes (Hansen, 1980).

The objective of an incentive is to increase participation in the data gathering process. This can motivate an individual with limited or no knowledge on the subject to participate only to obtain the benefit of incentive. Since incentives involve costs, some researchers cannot afford those and resort to lottery payments to attract participants. This may be considered unethical by some participants and may cause crowding-out effect. The lottery has always been the subject of the question. Those who oppose the lottery voice their concern as this may lead to a ddiction and may lead to a greater risk than the benefit it can provide. Still, this is a common practice of fund-raising in many communities to support the production of important public goods.

4. DATA QUALITY IN A FACE-TO-FACE SURVEY

Face-to-face surveys increase response rates and possibly data quality through several means. A face-to-face survey offers an opportunity to have a higher contact with the respondent than any other mode of interviews, surveys, or data gatherings, which leads to a lower nonresponse rate. The interviewer tries to keep the respondent engaged and motivated to obtain the correct answer (Couper, 2011; Szolnoki and Hoffman, 2013). Featuring the survey topic, sponsor and incentive, the interviewer increases the interest and motivation of the respondents to take part in the survey and offer correct answers. Interviewers can identify the respondents and record observable characters, and can ascertain additional information from body language, gestures, and facial expressions. This allows the interviewer to adjust the answers as needed to reflect the correct response appropriately. In addition, a face-to-face interview allows approaching respondents who are otherwise hard to reach to ask questions and get answers due to repetition, which are not possible to get answers otherwise, and to observe characteristics that are not possible in any other means.

Along with the improvement of data quality in a face-to-face survey, there exists the potential for compromising data quality as well. First, a face-toface survey may result in answers with social desirability bias individuals would like to give answers to what society desires instead of his/her personal answer. This is especially true for behavioral and attitudinal questions (Kaminska and Foulsham, 2013). Incorporating interviewers' own judgment in sample selection may lead to a decrease in data quality. By pursuing the respondents to remain engaged and motivated, the interviewer may end up incorporating his/her own bias, and the number of respondents may become tilted toward a certain section of the population. In addition, for some questions, respondents are more likely to answer alone rather than in front of the interviewer. Studies show that item nonresponse rate varies between face-to-face and other modes of survey depending on question type and information sought. The effect on data quality in a face-to-face survey may come from three different sources - media-related factors (familiarity, focus of control, silence, and sincerity), information transmission (available channels, presentation of stimuli, and regulation of communication), and interviewer impact (presence of an interviewer, specific interviewer behavior, etc.) (de Leeuw, 1992). Interviewer training to increase response rate and improve data quality must be emphasized. Three surveys from the 2002 and 2003 elections in Taiwan postulate that interviewer perception is complementary to survey data quality (Liu and Chen, 2004).

5. METHODOLOGY

A face-to-face survey of organic food consumption was conducted in Edmonton, Alberta, Canada. The sample respondents were selected randomly by visiting four major retail grocery stores that serve the city. There were six major grocery chains and two specialty stores focusing on local, fresh, and specialty foods. All of them were approached for their permission to interview their customers while entering the store. After repeated requests and with sufficient assurance that no personally identifiable information of the shoppers will be collected, the findings will only be used for research purposes, individual information will not be disclosed to anyone, and only general and aggregate information will be reported in research reports, two conventional grocery stores and the two specialty stores refused to allow our research assistants to collect information from their premises. So, we continued to collect data from the customers of the four cooperating stores.

Individual shoppers at the four cooperating stores were approached while they entered the store. To avoid any biasedness due to the time of the day or the day of the week, each store was visited three times a day (morning, early afternoon, and evening) and all seven days of a week (Sunday through Saturday) for seven consecutive weeks. Shoppers were approached while they entered the store. They were given assurance that the information collected from them was for research purposes only and only aggregate information would be reported. They were also given assurance that they were free to not answer any or part of any question and, as such, might stop giving information at any point within the interview process. The research assistants were offered lengthy training to ensure that they followed a consistent approach and asked the same scripted question and made all the respondents aware of the background and purpose of the data collection with the objective to minimize personal discrepancies. As no individual respondent filled out the questionnaire by himself/herself, it was easy to control the quality of information gathered through maintaining consistency among research assistants.

Half of the respondents were approached with the scripted question, "Would you be willing to spend approximately five minutes of your time to answer a few questions on a survey sponsored by the University? Any information you provide will be anonymous, and no identifiable personal question will be asked." This group of respondents was not given any exante information on the lottery payment. They were given the lottery information at the end of the interview, irrespective of whether the respondent answered all or part of the question. So, at the end of the interview, the respondents were told, "As a show of thanks, you are given the opportunity to include yourself in a lottery for dinner for two in an area restaurant, and the odds of winning such a lottery is one out of one hundred." The other half of the respondents were approached with the same question, but with the lottery, information added. For this group, the scripted question was, "Would you be willing to spend approximately five minutes of your time to answer a few questions on a survey sponsored by the University? Any information you provide will be anonymous, and no identifiable personal question will be asked. As a show of thank, you are given the opportunity to include yourself in a lottery for dinner for two in an area restaurant, and the odds of winning such a lottery is one out of one hundred." For both groups, individuals willing to participate in the lottery were given a blank card to write their nickname and phone number so that they could be contacted should they win the lottery. These cards were kept in a closed box, and the research assistants did not have access to them. The box was opened, and the lottery was drawn upon completion of the entire survey work - after seven weeks. Several respondents did not care about lottery payment and opted out to include their nickname and phone number on the card. Out of 719 respondents, 643 cards were received, and seven prizes were offered, with an odd of winning one out of 92.

In either case, the initial responses were dichotomous - either affirmative or negative. The affirmative answers were mostly 'okay', 'fine', 'yes', or 'go ahead'. The negative answers were 'no', 'sorry', 'no time', 'no, thank you' etc. Individuals with a negative answer were counted and used for computing the nonresponse rate. However, customers who were not approached but entered the store during the period were not counted as part of the sample [the research assistants were busy conducting an interview with other shoppers]. As indicated before, individuals agreeing to participate in the interview were given additional information that their participation was completely voluntary, and they could choose not to answer a particular question or could withdraw from participation at any time of the interview process. They were also assured that they would remain anonymous as no personal information would be collected. The information collected remains confidential and unidentifiable by participants. All respondents were told that the project received ethics approval from the University Research Ethics Board, and the contact information of the Chair was offered should anyone was interested. The interviewers carried an identity card containing their photographs and communicating information of the researcher.

We followed the procedure implemented by Davern et al., a threeindicator process to make use of incomplete questionnaires, as a framework for the measurement of data quality (Davern et al., 2003). These indicators are the number of edit-occurrences, imputation occurrences, and overall completeness (completion intensity - the proportion of incomplete answers). Questionnaires containing five percent or more omitted information were discarded and were not included in the imputation. Using sound judgment, questionnaires only with minor omissions or editions were imputed to ensure that the efficiency of the findings is strengthened rather than compromised. The degree of edit occurrences and minor amputations were recorded and regressed against some demographic characteristics using two different models - Model 1 with the entire dataset and Model 2 with only those containing edits and imputations. The characteristics we examined as independent variables are age, education [years of schooling], annual household income [nearest thousands], family size [number of people in the household], number of household members under 18 years of age, ethnicity as Caucasian, Hispanic, Canadian Indigenous, Asian Canadian and African Canadian [omitted from the analysis to avoid singularity as dummy variables are used], disclosure of lottery payment [either before or after as a dummy variable], frequency of shopping per week, frequency of buying organic foods per week and likeness of organic food with a score ranging from zero and five – zero being no like at all and five being the most like.

6. RESULTS AND DISCUSSION

Out of the total of 1540 shoppers, 719 offered an affirmative answer after the initial approach. The response rate as defined by affirmative answers or agreeing to participate in the survey among the shoppers approached was 46.69 percent, a substantially higher response rate than usual. In general, the response rate is higher in face-to-face surveys (Kibuchi, 2018), as interviewers play a significant positive role in receiving an affirmative response (Hox and de Leeuw, 2002; Durrant et al., 2010). Interviewers approach the respondents in a way that influences achieving cooperation and eventually influence them to participate, as expressed in the Leverage Salience Theory (Groves et al., 2000), which summarizes that 'a single survey design attribute will have different "leverages" on the cooperation decision for different persons (interviewers)' (Groves and Couper, 1998; Groves et al., 2000). This was based on the 1996 Detroit Area Study carried out by students at the University of Michigan. Thus, the motivation depends on whether the convincing attribute is made prominent to the respondent, and the interviewer's influence produces a feeling of obligation to join, increasing the participation rate in a face-to-face survey. An increase in the response rate in a face-to-face survey can be obtained through the diverse characteristics, attributes, and personalities of the interviewers, a commonly expressed term of interviewer effect, which has been researched elsewhere in statistical survey method studies (Kibuchi, 2018).

Part of the reason for the higher response rate in our study is attributed to the approach we followed or the way we calculated response rate - a percentage or proportion of the shoppers who were approached, rather than the percentage or proportion of the entire shoppers. Nonetheless, Kibuchi's conclusion that the interviewer's ability in 'recognizing, interpreting, and addressing visual cues' of the respondent and the selfconfidence they present may lead to greater cooperation resulting higher response rate with various degrees depending on the interviewer is less applicable in our case as we instituted scripted introductions by interviewers to minimize such variabilities.

The number of respondents in different categories is presented in Table 1. Out of the total of 719 participants, nearly half of the respondents have disclosed the lottery payment before beginning the interview, and the rest half were disclosed after (359 were per-disclosed and 360 were post-disclosed). The number of completed questionnaires was also nearly evenly distributed, 200 from pre-disclosed and 199 from post-disclosed lottery payment. In total, there were 399 complete questionnaires and 320 (a substantial number) incomplete questionnaires. The incomplete questionnaires were nearly evenly distributed between pre- and post-disclosed (162 in pre-disclosed and 158 in post-disclosed). However, there was a substantial difference in the proportion of incomplete questionnaires between pre- and post-disclosed that were made usable

Table 1: Data quality and lottery disclosure				
		Number	Percent of Total	
Pre-disclosed lottery		359	49.93	
	Complete questionnaire	200	27.82	
	Incomplete questionnaire	162	22.53	
	Incomplete made used	18	2.64	
Post-disclosed lottery		360	50.07	
	Complete questionnaire	199	27.68	
	Incomplete questionnaire	158	21.97	
	Incomplete made used	72	10.01	
Total respondent		719	100.00	
	Complete questionnaire	399	55.49	
	Incomplete questionnaire	320	44.51	
	Incomplete made used	90	12.52	
	Total used (N)	489	68.01	

The difference between the pre- and the post-disclosed committed lottery payment came from the usability of the incomplete questionnaires. Only 18 questionnaires (11.11%) were able to be used from 162 incomplete questionnaires from the pre-disclosed group. Whereas 72 questionnaires (45.57%) from 158 incomplete were able to be used from the post-disclosed group. This, apparently, may seem like the pre-disclosed lottery payment influenced the respondent to make a concrete decision on whether to complete the survey or not. However, such a conclusion may be over-simplistic and premature, and further studies are needed to have a definitive conclusion. To our knowledge, there is no such study that compares the completeness of survey questionnaires between pre- and post-disclosed commitment of lottery payment.

The face-to-face survey, in general, is considered a preferred option if resources allow it as it has several advantages. Interviewers can persuade the respondents with an amiable approach to take part in the survey, identify respondents, and offer an appropriate explanation of the research objective to motivate respondents and observe bodily gestures to record responses which they are reluctant to verbally express. However, it can be concluded that a face-to-face survey with a higher response rate does not necessarily offer a better result than an online survey with a lower response rate (William, 2017); Kibuchi, 2018).

A common concern comes about the difference in response rates among people of different ethnic origins. Table 2 shows the number of respondents with usable questionnaires under different ethnic origins. Although the individual shoppers were approached randomly with the only predetermined idea to have a nearly equal number of questionnaires to be filled in for pre- and post-disclosed lottery payments, the actual number became slightly different due to the completion rate and usability of questionnaires by individuals of different ethnic groups. However, ironically, the proportion of usable questionnaires from different ethnic groups came close to the population as reported in the census [last two columns of Table 2]. The largest difference was in Canadian Indigenous [2.04 percent questionnaire as opposed to 5.3 percent in Census 2016], followed by Asian Canadian [20.25 percent questionnaire as opposed to 24.5 percent in Census 2016]. Nonetheless, these differences are not expected to incorporate substantial bias in the results.

Table 2: Ethnic background of respondents with usable questionnaires					
Ethnicity	Pre-disclosed	Post-disclosed	Total	Percent of total	Census 2016
Canadian Indigenous	4	6	10	2.04	5.3
Asian Canadian	45	54	99	20.25	24.5
Hispanic Canadian	4	4	8	1.64	1.7
African Canadian	11	9	20	4.09	3.8
Caucasian	154	198	352	71.98	64.7
Total	218	271	489	100.00	100.0

The demographic information of respondents is presented in Table 3. With an average age of 40.89, the respondent's ages ranged from 16 to 83 years. According to Census 2016, the average age of the population in the census district is 37.8 years, which is comparable. The higher average age of respondents makes sense as this is the average for adults [shoppers] only and does not include individuals of underage – perhaps below 16 years. Similarly, the education level was wide, 6 to 20 years of schooling, with an average of 15.94. This indicates that the respondents were relatively highly educated. In general, Edmonton being the capital city of Alberta, the average education level is higher than the provincial and national average. The average annual household income of respondents [\$127,510 vs. \$123,650 in the census] and the average family size [3.06 vs. 3.0 in the census] correspond closely with what was reported in the recent census.

Overall, the respondents can be considered representative of the general population in demographic terms. On average, household shops for groceries just over 2.5 times a week with buying some organic foods in 1.76 times a week. As for the degree of likeness of organic foods, the range varies from no preference at all to highest preference [on a scale of 0 to 5], with an average of 1.74 indicating that conventional shoppers have some degree of likeness [preference] toward organic.

Table 3: Demographics of respondents with usable questionnaires				
Variable	Obs.	Average	SD	Range
Age	489	40.89	15.40	16 - 83
Education in years of schooling	489	15.94	2.79	6 - 20
Family size	489	3.06	1.52	1 - 9
Family member under 18	489	0.67	1.44	0 – 5
Annual Income in thousands	489	127.51	79.53	30 - 380
Grocery shopping per week,	489	2.57	0.79	0 – 5
Frequency of buying organic per week	407	1.76	1.92	0 – 5
Degree of likeness of organic 0 – 5 scale	408	1.34	0.74	0 – 5

The regression results of the impact of demographic characteristics on data quality as expressed by edit occurrence, imputation frequency, and completion intensity are presented in Table 4. Out of the 162 observations in Model 2, 72 have only edit occurrences with no imputation requirement or incomplete answers. Ninety-two questionnaires require minor imputations and some degree of incomplete answers. In this model, there are positive values for all observations in the dependent variable [data quality index]. In Model 1, these 162 observations have positive values, and the rest 327 observations have zero values in the dependent variable. It is interesting to note that the results in the two models are nearly identical, indicating the robustness of the results. As expected, the Rsquare values increase substantially in Model 2. However, the signs and significance levels of coefficients remain the same in both models, except the grocery shopping frequency for which Model 2 exhibits significance. The two variables that show a significant negative impact on data quality are the frequency of buying organic food per week and the likeness score of organic food. This makes sense as those shoppers who like organic food are more likely to buy organic food with higher frequency and are to be more concrete about their decision on buying organic food. It is expected that their answers are to be more complete and less erratic, as indicated by the negative signs of the coefficients.

Table 4: Regression analysis				
	Model 1	Model 2		
Intercept	0.0651	0.2067**		
Disclosure	0.0070	-0.0003		
Age in years	0.0003	-0.0003		
Education – years of schooling	0.0012	-0.0012		
Annual household income	0.0000	0.0000		
Family size – household members	-0.0017	-0.0005		
Family members under 18	0.0057	0.0001		
Ethnicity - Caucasian	0.0221	0.0205		
Ethnicity - Hispanic	0.0291	-0.0362		
Ethnicity – Canadian Indigenous	0.0409	0.0052		
Ethnicity – Asian Canadian	-0.0093	-0.0252		
Discrepancy between pre- and post-disclosure	0.0070	-0.0003		
Grocery shopping per week	-0.0002	-0.0083**		
Buying organic per week	-0.0109**	-0.0122**		
Likeness of organic 0 – 5	-0.0315**	-0.0160**		
R Square	0.3577	0.6981		
R Square Adjusted	0.3401	0.6716		
Ν	489	162		

**Significant at 1 percent level

What motivates an individual to become a subject for socio-economic research and offer error-free response is an age-old question. Although the

question seems simple, the answer is not. Some people are intrinsically motivated by the objective of the research project and are willing to volunteer their time and effort with no need for incentive or compensation. Such a behavior can be characterized and explained as 'social exchange' separating from the economic exchange (Blau, 1964). A theory of motivation combining an individual's 'degree of altruism and greed' was developed based on those types of behavior (Benabou and Tirole, 2006). The total motivational effect was divided into three different components - intrinsic, extrinsic, and reputational. An analysis of individual choice based on context, a combination of four sets of results can come up. First, Reward and Punishment - in the presence of a purely altruistic choice, an external incentive degrades the reputational value of good work and results in a crowding-out effect. On the other hand, a promising incentive may drive to present oneself as needy and respond to participate in the survey without offering much attention to the fact (Stecklov et al., 2018). Second, Publicity, Praise, and Shame - a social contribution generates prominence and encourages to do more. Third, Social and Personal Norm – people choose their actions based on what others do, a situation of positive network externality allowing multiple norms. This can be strategic complements or substitutes, depending on the situation. Fourth, Welfare and Compensation - complementarity or substitutability of non-quantifiable incentives. Later on, two conflicting effects - Negative Image Effect and Reputation Effect, and a combination of both - Interaction Effects for prosocial behavior, were observed (Exley, 2018). However, it is difficult to establish a general correlation between overall human behavior and motivation to become the subject of survey research or become a respondent.

Although the explanations provided above are powerful analyses of human behavior related to motivation, none of these models provides a practical solution or a unique answer to the question posed above. Common incentives are always more effective than prosocial incentives in the increasing participation rate (Schwartz et al., 2019). Individuals' choices are usually based on the combination of several motivating factors – complementarity and competitiveness. Potential conflicts between altruistic motivational factors and psychological egoism exist between individuals as the division between them is not completely black and white. Such conflicts may also arise within an individual's mind and may result in different behavior from one case to another and from one time to another.

In many research studies, respondents participate in an interview process for their altruistic nature (Gneezy et al., 2011; Knowles and Stahlmann-Brown, 2021). In a way, such respondents think that they are making a charitable contribution to others or to society by participating in the survey and offering their input to the researchers. These people are intrinsically motivated and do not require an external motivational force. Rather, a further motivational effort, especially through incentives, may backfire, resulting in a lower response rate and data quality (Frey and Jegen, 2001; Benabou and Tirole, 2006). This may be true for socioeconomic research studies where the expected results are to formulate appropriate policies and procedures for the betterment of society. For example, people participate in the election process as voters and complete census questionnaires as their civic duty. Although they spend their time, effort, and energy, they hardly expect any compensation for those. These people may find compensation or incentives offensive as this will simply undermine their altruistic nature. They will become suspicious of the motives of data gathering and may likely become reluctant to participate and provide useful information.

Data quality as indicated by the number of edit occurrences, imputation occurrences, and completeness of questions is not significantly affected by any of the characteristics studied – lottery disclosure [pre- or post-disclosure], age, education, ethnicity of the respondent, and household size. The frequency of shopping per week, buying organic, and likeness of organic food affect data quality. It is imperative that those shoppers who shop more frequently, buy more organic food, and like organic foods are more likely to participate in the organic food purchasing behavior than those who shop less frequently, buy less organic and do not like organic. Our results are unique in the sense that so far, our knowledge goes, there are no such studies on this.

7. SUMMARY AND CONCLUSION

Different forms of incentives have been used by survey researchers to increase the response rate for many years, and the impact of such incentives on response rate and data quality has been studied widely. However, the impact of incentives in the form of lottery in face-to-face surveys has not been studied extensively, especially on the disclosure of lottery payment before and after the interview. This study fills that gap in the literature. Our study shows no influence of committed lottery payment on response rate and data quality. Also, there is no difference in age, education, income level, or ethnicity in responding to incentives. Respondents who shop more frequently and like organic foods are more likely to offer better data quality. This makes sense as those individuals are more informed and knowledgeable. Data quality measured by the number of edit occurrences, the number of imputation occurrences, and the proportion of completed questions do not get affected by whether the incentive commitment is disclosed before or after the survey. This is an indication that people choose to participate as research subjects for a variety of reasons, and incentive is one among those. These reasons not only depend on the individual behavior but also on the mode of the survey institution and how the researchers approach the prospective participant. The objective of the research project plays a vital role as well. If the research is purely for the public good and the objective of that is clearly communicated to the prospective respondents, they are more likely to volunteer their time and effort in offering quality data (Islam and Tanasiuk, 2013). A similar idea that participants volunteer their time and effort for charitable reasons was also reported by others (Grady, 2001). although some form of compensation may always be effective, increasing response rate.

An interesting result needs further study is the proportion of incomplete questionnaires between the pre- and post-disclosed lottery payment. Respondents with pre-disclosed lottery had a much higher rate of incomplete questionnaires. Further studies with a focus on the completion rate of questionnaires of pre- and post-disclosed committed lottery payment along with the behavioral characteristics of respondents may provide better information resulting in a compelling conclusion.

CONFLICT OF INTEREST

The author declares no conflict of interest, financial or otherwise

DECLARATION

The author declares that the manuscript has not been published, nor has it been submitted anywhere else for publication

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