Can the Ten Commandments Mitigate Hypothetical Bias?

Kar Ho Lim
Assistant Professor
klim@tnstate.edu
Department of Agricultural and Environmental Sciences
Tennessee State University
204c Farrell-Westbrook Complex, Nashville, TN 37209, Phone (615) 963-7977

Carola Grebitus
Assistant Professor
Carola.gebitus@asu.edu
Morrison School of Agribusiness, W.P. Carey School of Business, Arizona State University,
7231 E. Sonoran Arroyo Mall, Mesa, AZ 85212, Phone (480) 727-4098.

Wuyang Hu
Professor
Wuyang.hu@uky.edu
Department of Agricultural Economics, University of Kentucky
313 C.E. Barnhart Building Lexington, KY 40546-0276

Rodolfo M. Nayga, Jr.
Professor and Tyson Chair in Food Policy Economics
rnayga@uark.edu
Department of Agricultural Economics & Agribusiness, University of Arkansas
217 Agriculture Building Fayetteville, AR 72701 Phone: (479)575-2299

Selected Paper prepared for presentation at the 2015 Agricultural & Applied Economics Association and Western Agriculture Economics Association Annual Meeting, San Francisco, CA, July 26-28.

Can the Ten Commandments Mitigate Hypothetical Bias?

Abstract

While a number of hypothetical bias mitigation methods have been proposed, the problem remains, and the debate persisted on the effectiveness and practicality of the mitigation methods (Loomis, 2014). We propose an easy to implement method to mitigate hypothetical bias in the context of choice experiments. The method involves asking respondents to recall the Ten Commandments prior to the willingness to pay elicitation. Our results show that the proposed method exhibits signs of hypothetical bias mitigation.

Keywords: Choice experiments, Honesty, Hypothetical bias, Ten Commandments

JEL Codes: C18, C90, D12

Willingness to pay (WTP) is a fundamental concept in microeconomics. Economists face considerable challenges in empirical measurement of the amount a person is willing to pay for goods and services. The challenge is particularly true for public goods where a market may not exist or for novel private goods that are too new for a market to exist. Since there is no actual behavior that took place in the market to be measured, practitioners often have to draw from stated preferences – i.e., what people says they would pay, rather than revealed preferences – what they actually pay in real life. The deficiency has drawn criticisms, perhaps the most stinging were “Is some number better than no number” and “From dubious to hopeless” by Diamond and Hausman (1994) and Hausman (2012).

While a number of hypothetical bias mitigation methods have been proposed—e.g., real talk (Alfnes et al., 2010); cheap talk (Cummings and Taylor, 1999); inferred valuation (Lusk and Norwood, 2009); oath taking (Jacquemet et al., 2013); consequentiality)(Bulte et al., 2005); personality (Grebitus et al., 2013)— the problem remains as the literature continues to debate the effectiveness and practicality of the mitigation methods. We propose an easily implemented religious priming method to mitigate hypothetical bias in choice experiments. The potential of the method to mitigate hypothetical bias is shown using a pairwise comparison of WTP estimates.

Hypothetical Bias

Hypothetical bias is the difference between individuals' true WTP and stated WTP, and thus can be an under- or overestimation of stated WTP (Loomis, 2014). Most empirical evidence suggests that hypothetical bias manifests itself as an overestimation of WTP. This is supported by meta-analyses, which report a median calibration factor in the range of 1.35 (Murphy et al., 2005) to around 3 (List and Gallet, 2001, Little and Berrens, 2004). The discrepancy in the calibration factors shows that the measurement of hypothetical bias is not a straight forward process. Among others, the specific methods used to measure WTP and the nature of the goods could contribute to the discrepancy.

While the focus is in the biasness of stated WTP, the hurdle to solve the puzzle could be due to the challenge to measure the base to calculate hypothetical bias – the "true" WTP, since there is no simple way to accurately measure the amount a person truly intends to pay (Loomis, 2014). For private goods, "real" choice experiments and experimental auctions are widely used to estimate true WTP. However, the estimates remain as best a proxy, as the experiments are typically conducted in lab settings using convenience samples. For instance, the interactions between experimenters and respondents increase the potential of social desirability bias, which is thought to contribute to hypothetical bias (Adam et al., 2015, Harrison and List, 2004, Kreuter et al., 2008). In addition, Moser et al. (2013) finds that real choice experiments that provide payment for participants could induce house money bias, in which respondents' treatment of the budget was distorted so that it also distorted their behavior. Smith (1994) argues that experimental auctions could be susceptible to "false zero" bids, when a bidder held off bidding to exit the auctions, rather than having a true WTP of zero.

Although no universally accepted theory emerges as to what causes hypothetical bias (Little and Berrens, 2004, Loomis, 2011, Mitani and Flores, 2013), various studies point to respondents' lack of incentive to reveal their true intention in hypothetical experimental settings (Diamond and Hausman, 1994, Loomis, 2011, Loomis, 2014, Lusk and Schroeder, 2004). Nevertheless, major efforts have been put forth on inducing incentive-compatible behavior from respondents during preference elicitation process. In what follows we describe the popular cheap talk approach and the proposed approach in this study. ??

Cheap Talk Script

The cheap talk script is likely the most widely applied hypothetical bias mitigation method. The script, introduced by Cummings and Taylor (1999), describes to participants the problem of hypothetical bias, and subsequently encourages participants to respond as if the experiment was a real decision.

In the context of choice experiments conducted for private goods, the results are mixed. Several studies found that the cheap talk script lowers WTP for attributes of food items (Carlsson et al., 2005, Tonsor and Shupp, 2011). However, Moser et al. (2013) and Silva et al. (2011) found that the script has a limited effect, noting that WTP cannot be distinguished between choice experiments with and without a cheap talk script. The key finding is that cheap talk does not mitigate hypothetical bias in all settings. Loomis (2014) describes a vibrant ongoing search of more effective hypothetical bias mitigation tools.

Honesty Approach

This approach argues that hypothetical bias is a result of dishonesty behavior. As such, hypothetical bias can be mitigated by exhorting respondents to act in an honest way. In an experimental auction, Jacquemet et al. (2013) uses oath as a truth-revealing mechanism, in which the bidders took oath – swearing on their honor that they would give honest valuation in experimental auction. They found that taking an oath lowers bids compared to a purely hypothetical auction. In a separate study, Stevens et al. (2013) echoes that oath reduces the magnitude of hypothetical bias. Nevertheless, whether the method is feasible in non-lab setting remains a question. The solemn oath might be viewed as too intrusive by some, for example, the Bible discourages Christians from taking oaths. Further, it remains a question if respondents would comply to take an oath when participating. .

The problem of intrusiveness could potentially be sidestepped with religious priming. In Shariff and Norenzayan (2007), participants were assigned to one of two groups conducting a sentence rearranging task, only one group received sentences with religious wording. The authors found that participants who were assigned with the religiously primed text exhibited greater altruistic behavior than the control group. de-Magistris et al. (2013) expanded the religious priming method and found it to be effective in hypothetical bias mitigation. Mazar et al. (2008) provides further evidence of the linkage between religious priming and honest behavior. They show that by requesting participants to recall the Ten Commandments eliminate prevalence of dishonesty. We follow their approach in the context of a choice experiment.

Method

Design of the study

The objective of this study is to test the Ten Commandment recall task (Mazar et al. (2008) as a hypothetical bias mitigation tool in choice experiments. The Ten Commandment recall task is a prime candidate as it is easy to implement, and it is arguably less intrusive than the oath taking task described in Jacquemet et al. (2013). The Ten Commandment recall task could be a viable alternative to the religious priming sentence task in de-Magistris et al. (2013), where participants have to rearrange 25 sentences. Stachtiaris et al. (2011) use a subset of ten religious sentences but fail to replicate the hypothetical bias mitigation effect. We investigate the efficacy of the Ten Commandment recall task in contrast to a cheap talk script using choice experiments in a between-sample comparison. The respondents were distributed across four experimental treatments. In all treatments, the respondents were given the instruction to complete a choice experiment for canned tuna. Treatment one serves as the control, without any hypothetical bias intervention. Treatment two features a cheap talk script adapted from Lusk (2003). As one of the most utilized hypothetical bias mitigation method, the method is a suitable reference point for comparison and illustration of effectiveness of other methods. We provided the respondents in this treatment with a short script. The script provides a simple description of hypothetical bias. The respondents are then asked to choose as if they are spending real money. The respondents were also reminded about budget constraints, in that any expenditure for the products in this experiment would reduce their ability to spend for other purchases.

Treatment three features the Ten Commandments recall task. As in Mazar et al. (2008), respondents were asked to recall to the best of their ability the scriptural ethical guidelines. The hypothesis is that this task induces respondents to act more honestly, thereby inducing truthful revelation of their WTP. We expect this mechanism to show the same reduction in WTP as in the cheap talk script. As a control to the Ten Commandments recall task, respondents were asked to list ten of their favorite books in treatment four. This control aims to show that the effect from the Ten Commandments recall task is not simply an artifact of a memory task. We hypothesize that the book recall task will not have any effect on the WTP.

Choice experiments

The choice experiment features WTP elicitation for quality attributes and geographical indicators of five ounce canned tunas. In addition to price, the attributes included in the choice experiment were country of origin labeling (no label, USA, Vietnam, and Ecuador), a BPA free label, a sustainability label (the Marine Stewardship Council's certificate), and a "heart-healthy" label—the latter three were either present or not on the product. These attributes were used to design choice sets consumers face in the survey.

Central to the analysis is to measure differences in WTP based on the four treatments. Specifically, we are interested at finding systematic differences in stated WTP for attributes that are indications of hypothetical bias mitigation. As Tonsor and Shupp (2011) noted, most evaluations of hypothetical bias mitigation methods were done through the use of convenience samples or lab settings. This study departs from this norm as we used a sample consisting of the general population. The respondents consisted of 773 seafood consumers. The number of respondents was chosen to allow for sufficient degrees of freedom. The baseline and cheap talk script treatments received one-third of the sample respectively as these groups are used as reference groups. The Ten Commandments recall task and the book recall task treatments each received one-sixth of the sample. We stratified the sample according to age, education, and income such that demographic factors are consistent across treatments. Both ANOVA and

Mann-Whitney tests fail to reject statistical equivalence in the demographic characteristics (see table 1).

Econometric Model

We analyzed the data from the choice experiments with mixed logit models and we derived posterior individual-level parameters based on the model. Revelt and Train (2000) individual-level parameters method allows to derive respondents' WTP for the attributes. The individual WTP enables statistical testing of the treatment effects. In the context of our study, the individual-level parameter method is appealing because it enables direct comparison of the difference across treatments when applied in conjecture with the Mann-Whitney U-test.

As consumers' preference for the examined attributes for canned tuna are expected to be heterogeneous, the mixed logit model is appealing for its ability to encompass taste heterogeneity and its ability to relax the IIA assumption of the conditional logit model (Train, 2003). Formally, a consumer's utility from consuming canned tuna can be represented as:

$$\begin{gathered} \mathrm{U}_{ijt} = \alpha \mathrm{p}_{\mathrm{ijt}} + \boldsymbol{\beta}'_{i}\mathbf{x}_{ijt} + \varepsilon_{ijt} \\ \boldsymbol{\beta} \sim \mathrm{g}(\boldsymbol{\beta}|\boldsymbol{\theta}) \end{gathered} \quad \textbf{(1)}$$

where subscript i, j, and t denote individual, choice set, alternative respectively. The model estimates α , the fixed parameter associated with price (p). The parameters associated with non-price attributes ($\mathbf{x}_{ijt}$) are assumed to be randomly distributed, this is to represent taste heterogeneity. Thus, the model estimates $\boldsymbol{\theta}$ – the mean and standard deviation of the random parameters (**$\boldsymbol{\beta}$)**. The stochastic error term in (1) is assumed to follow IID Type I Extreme Value Distribution.

Given that each respondent completed a series of choices, this information can be used to form a more precise conditional distribution. Revelt and Train (2000) shows that the conditional distribution can be derived using Bayes' Rule. Train (2003) shows that the conditional distribution converges to the true individual parameters as the number of choice set increase. The WTP, which is a measure of the marginal rate of substitution involving the tradeoff between attributes and price, is calculated as the ratio of individual parameter over the price coefficient specific to the treatment (Hanemann, 1983).

Results

We interpret hypothetical bias mitigation as a reduction in absolute value of WTP. This practice is consistent with evidence from meta-analyses (List and Gallet, 2001, Little and Berrens, 2004) and recent studies (Carlsson et al., 2005, de-Magistris et al., 2013, Moser et al., 2013, Silva et al., 2011, Tonsor and Shupp, 2011). We used a Mann-Whitney U test to show the difference across treatments. ANOVA could be inaccurate as the WTP estimates might be not normally distributed or heterogeneous in variance. Table 2 reports the results.

The cheap talk script shows evidence of its effectiveness in mitigating hypothetical bias. Of the seven WTP estimates, five estimates exhibit statistically significant differences in mean values. The difference follows the pattern one expected from hypothetical bias mitigation, that is, reduction in absolute value of WTP. For example, the average WTP for canned tuna bearing the label "Product of USA" is $1.82/can in the control sample. However, the same WTP drops to an average of $1.44/can in the group receiving cheap-talk script treatment. The mitigation ranged from 9.3% to 32.3%. The largest were the estimates for Marine Stewardship Council's sustainability certificate, where the WTP decreased from $0.74/can in the control to $0.49/can.

The Ten Commandments recall task also provides evidence of hypothetical bias mitigation. Similar to the cheap talk script, five of seven estimates are statistically different in mean values. All the differences follow the trait of reduction in absolute value, ranging from 6.7% to 52.2%. Mazar et al. (2008) provide a plausible mechanism of the recall task to mitigate hypothetical bias. They argue that people create an internal equilibrium, such that they still maintain an honest self-image while committing a dishonest act – a behavior that they coined as the theory of self-maintenance. Thus, if respondents involved in a WTP elicitation exercise are able to rationalize away the self-confrontation from providing inaccurate responses this ultimately results in hypothetical bias. The self-rationalization could be due to a perception that inaccurate response is an acceptable norm in answering survey. This could lead to satisficing – dispensing minimal effort to complete the survey (Krosnick et al., 1996, McAllister and Makkai, 1991). Further, this could lead to social desirability bias, where respondents sought to cast themselves in the best light by reporting when they expect as the “correct” social behavior (Fisher, 1993, King and Bruner, 2000, Kreuter et al., 2008).

The psychology literature illustrates that respondents can be called upon to pay attention to their standard of conduct, thereby correcting the tilt to dishonesty. Mazar et al. (2008) argues that when people are not attentive to their own moral standard, actions are not being evaluated to a person’s own standard of moral. With stimulus, they can be induced to be attentive of their own morality standard. The attentiveness to own moral standard, they argue, may lower the threshold to which people can be dishonest without facing the negative self-image. Mazar et al. (2008) found that Ten Commandments recall task serve as an effective stimuli to induce mindfulness to moral standard. Similarly, the mitigation of hypothetical bias could be a result of respondents being nudged to honesty.

The question arises as to which of the two methods shows greater effectiveness in hypothetical bias mitigation. We performed the Mann-Whitney U test for the Cheap Talk script against the Ten Commandments recall task. The results show that six of the seven WTP estimates were statistically different. Of those, the Ten Commandment recall task shows lower absolute values on four of the six estimates. While the better of the two methods remains unclear, the Ten Commandments recall task appears to be a viable alternative to the Cheap Talk Script.

We expected the Book recall task, which acts as the control of the Ten Commandments recall task to have no effect on the WTP estimates but the results show the contrary. Comparing the Book recall task to the baseline, we observe that six of seven of the estimates are significantly different to the control. However, the effects differ from those of the cheap talk script and the Ten Commandments recall task. The effects do not exhibit a consistent pattern of hypothetical bias mitigation. Three of the WTP measures of the Book recall task are larger in absolute value than those of the control group. The data does not provide an answer to this phenomena, however, it lends itself to the theory of constructed preference, where seemingly unrelated cues affect preference. For example, Ariely et al. (2006) showed that the last two digits of the social security number correlated positively with stated WTP when respondents wrote them down before the experiment.

Conclusion

The credibility of stated preference methods remains bounded by the problem of hypothetical bias. While a number of methods have been proposed as mitigation tool, none is a silver bullet. The effectiveness and feasibility of existing methods needs to be investigated. Using insight generated by religious priming, we propose a hypothetical bias mitigation with the easy-to-implement Ten Commandments recall task. We showed that by requiring respondents to complete a short task of recalling the Ten Commandments prior to WTP elicitation, we are able to induce WTP reflecting patterns consistent to those of hypothetical bias mitigation. On a bigger scale, our results suggest that the theory of self-maintenance could be a reasonable entry point to generate further understanding of hypothetical bias.

Our results are promising regarding hypothetical bias mitigation, nevertheless, more research is needed to verify its effectiveness in other valuation methods, such as contingent valuation and experimental auction; and other types of public and private goods. In addition, future research could investigate the potential of combining cheap talk with the Ten Commandments recall task.

References

Adam, M.T., J. Krämer, and M.B. Müller. 2015. "Auction Fever! How Time Pressure and Social Competition Affect Bidders' Arousal and Bids in Retail Auctions." *Journal of Retailing*.

Alfnes, F., C. Yue, and H.H. Jensen. 2010. "Cognitive dissonance as a means of reducing hypothetical bias." *European Review of Agricultural Economics* 37:147-163.

Ariely, D., G. Loewenstein, and D. Prelec. 2006. "Tom Sawyer and the construction of value." *Journal of Economic Behavior & Organization* 60:1-10.

Bulte, E. et al. 2005. "The effect of varying the causes of environmental problems on stated WTP values: evidence from a field study." *Journal of Environmental Economics and Management* 49:330-342.

Carlsson, F., P. Frykblom, and C. Johan Lagerkvist. 2005. "Using cheap talk as a test of validity in choice experiments." *Economics Letters* 89:147-152.

Cummings, R.G., and L.O. Taylor. 1999. "Unbiased Value Estimates for Environmental Goods: A Cheap Talk Design for the Contingent Valuation Method." *The American Economic Review* 89:649-665.

de-Magistris, T., A. Gracia, and R.M. Nayga. 2013. "On the Use of Honesty Priming Tasks to Mitigate Hypothetical Bias in Choice Experiments." *American Journal of Agricultural Economics* 95:1136-1154.

Diamond, P.A., and J.A. Hausman. 1994. "Contingent valuation: Is some number better than no number?" *The Journal of economic perspectives* 8:45-64.

Fisher, R.J. 1993. "Social desirability bias and the validity of indirect questioning." *Journal of Consumer Research*:303-315.

Grebitus, C., J.L. Lusk, and R.M. Nayga. 2013. "Explaining differences in real and hypothetical experimental auctions and choice experiments with personality." *Journal of Economic Psychology* 36:11-26.

Hanemann, W.M. 1983. "Marginal Welfare Measures for Discrete Choice Models." *Economics Letters* 13:129-136.

Harrison, G.W., and J.A. List. 2004. "Field experiments." *Journal of Economic Literature*:1009-1055.

Hausman, J. 2012. "Contingent valuation: from dubious to hopeless." *The Journal of economic perspectives* 26:43-56.

Jacquemet, N. et al. 2013. "Preference elicitation under oath." *Journal of Environmental Economics and Management* 65:110-132.

King, M.F., and G.C. Bruner. 2000. "Social desirability bias: A neglected aspect of validity testing." *Psychology and Marketing* 17:79-103.

Kreuter, F., S. Presser, and R. Tourangeau. 2008. "Social Desirability Bias in CATI, IVR, and Web Surveys: The Effects of Mode and Question Sensitivity." *Public Opinion Quarterly* 72:847-865.

Krosnick, J.A., S. Narayan, and W.R. Smith. 1996. "Satisficing in surveys: Initial evidence." *New Directions for Evaluation* 1996:29-44.

List, J.A., and C.A. Gallet. 2001. "What experimental protocol influence disparities between actual and hypothetical stated values?" *Environmental and Resource Economics* 20:241-254.

Little, J., and R. Berrens. 2004. "Explaining disparities between actual and hypothetical stated values: further investigation using meta-analysis." *Economics Bulletin* 3:1-13.

Loomis, J. 2011. "What's to Know about Hypothetical Bias in Stated Preference Valuation Studies?" *Journal of Economic Surveys* 25:363-370.

Loomis, J.B. 2014. "Strategies for overcoming hypothetical bias in stated preference surveys." *Journal of Agricultural and Resource Economics* 39:34-46.

Lusk, J., and T.C. Schroeder. 2004. "Are Choice Experiments Incentive Compatible? A Test with Quality Differentiated Beef Steaks." *American Journal of Agricultural Economics* 86:467-482.

Lusk, J.L. 2003. "Effects of cheap talk on consumer willingness-to-pay for golden rice." *American Journal of Agricultural Economics* 85:840-856.

Lusk, J.L., and F.B. Norwood. 2009. "Bridging the gap between laboratory experiments and naturally occurring markets: an inferred valuation method." *Journal of Environmental Economics and Management* 58:236-250.

Mazar, N., O. Amir, and D. Ariely. 2008. "The dishonesty of honest people: A theory of self-concept maintenance." *Journal of Marketing Research* 45:633-644.

McAllister, I., and T. Makkai. 1991. "Correcting for the underreporting of drug use in opinion surveys." *Substance Use & Misuse* 26:945-961.

Mitani, Y., and N. Flores. 2013. "Hypothetical Bias Reconsidered: Payment and Provision Uncertainties in a Threshold Provision Mechanism." *Environmental and Resource Economics*:1-22.

Moser, R., R. Raffaelli, and S. Notaro. 2013. "Testing hypothetical bias with a real choice experiment using respondents' own money." *European Review of Agricultural Economics*:jbt016.

Murphy, J.J. et al. 2005. "A meta-analysis of hypothetical bias in stated preference valuation." *Environmental and Resource Economics* 30:313-325.

Revelt, D., and K. Train. 2000. Title."Unpublished, Institution|.

Shariff, A.F., and A. Norenzayan. 2007. "God is watching you priming God concepts increases prosocial behavior in an anonymous economic game." *Psychological science* 18:803-809.

Silva, A. et al. 2011. "Revisiting Cheap Talk with New Evidence from a Field Experiment." *Journal of Agricultural and Resource Economics* 36:280.

Smith, V.K. 1994. "Lighting Rods, Dart Boards, and Contingent Valuation." *Nat. Resources J.* 34:121.

Stachtiaris, S. et al. 2011. "Can religious priming induce truthful preference revelation?".

Stevens, T.H., M. Tabatabaei, and D. Lass. 2013. "Oaths and hypothetical bias." *Journal of Environmental Management* 127:135-141.

Tonsor, G.T., and R.S. Shupp. 2011. "Cheap Talk Scripts and Online Choice Experiments:“Looking Beyond the Mean”." *American Journal of Agricultural Economics* 93:1015-1031.

Train, K. 2003. *Discrete choice methods with simulation*. New York: Cambridge Univ Press.

Table 1. Summary Statistics

	Full Sample	Baseline	Cheap Talk	Ten Commandments	Book Recall
Age	44.6352	44.6596	44.6596	44.1457	45.0278
	(14.9717)	(15.0525)	(15.0525)	(14.9688)	(14.8045)
Child	0.7710	0.8154	0.7385	0.8425	0.6746
	(1.0119)	(1.0419)	(0.9710)	(1.0573)	(0.9865)
Female	0.7490	0.7500	0.7500	0.7480	0.7460
	(0.4339)	(0.4338)	(0.4338)	(0.4359)	(0.4370)
College	0.3907	0.3962	0.3731	0.4016	0.4048
	(0.4882)	(0.4900)	(0.4846)	(0.4922)	(0.4928)

Note: Standard Deviation in parentheses.

Table 2. Summary Statistics of Individual Willingness to Pay Estimates ($/can)

Variables	Full Sample	Baseline	Cheap Talk	Ten Commandments	Book Recall
Opt-Out	-9.0139	-10.2892	-7.6439 [a]	-9.7250 [ab]	-8.4927 [a]
	(6.1506)	(6.7597)	(4.9453)	(6.3948)	(6.2443)
USA	1.5533	1.8208	1.4363 [a]	1.2815 [ab]	1.5166 [a]
	(0.3971)	(0.4135)	(0.2789)	(0.0023)	(0.4523)
Vietnam	-0.7404	-0.8366	-0.6171 [a]	-0.8707 [b]	-0.6652 [a]
	(0.6638)	(0.3889)	(0.5270)	(0.7631)	(1.0822)
Ecuador	-0.7390	-0.8142	-0.7381 [a]	-0.3895 [ab]	-0.9379 [a]
	(0.2138)	(0.0016)	(0.2266)	(0.0149)	(0.0078)
MSC	0.6242	0.7383	0.4996 [a]	0.4833 [a]	0.7875
	(0.4304)	(0.4255)	(0.2581)	(0.3688)	(0.6226)
BPA	0.5372	0.4798	0.5343	0.4603 [b]	0.7391 [a]
	(0.3574)	(0.4559)	(0.3354)	(0.2118)	(0.1613)
Heart-Healthy	0.7306	0.7111	0.7197	0.6676 [ab]	0.8566 [a]
	(0.1884)	(0.1666)	(0.1540)	(0.2152)	(0.2117)

Notes:
[a] denotes significance at 95% level comparing treatment to baseline with Mann-Whitney U test
[b] denotes significance at 95% level comparing Ten Commandments treatment to Cheap Talk Script with Mann-Whitney U test
Standard Deviation in Brackets

Appendix: Mixed Logit Model Estimates

	Baseline		Cheap Talk		Ten Commandments		Book Recall	
Estimates of Random Parameters								
Opt-Out	-5.3649	***	-5.4830	***	-6.2556	***	-5.5287	***
	(0.5006)		(0.5067)		(0.8199)		(0.7871)	
USA	0.9532	***	1.0359	***	0.8168	***	0.9888	***
	(0.1172)		(0.1281)		(0.1481)		(0.1964)	
Vietnam	-0.4393	***	-0.4390	***	-0.5562	***	-0.4179	**
	(0.0997)		(0.1210)		(0.1695)		(0.1983)	
Ecuador	-0.4264	***	-0.5311	***	-0.2486	*	-0.6116	***
	(0.0902)		(0.1105)		(0.1313)		(0.1626)	
MSC	0.2521	***	0.3812	***	0.2918	***	0.4814	***
	(0.0536)		(0.0627)		(0.0735)		(0.0939)	
BPA	0.3872	***	0.3597	***	0.3093	***	0.5176	***
	(0.0559)		(0.0604)		(0.0803)		(0.1090)	
Heart-Healthy	0.3729	***	0.5197	***	0.4239	***	0.5597	***
	(0.0546)		(0.0665)		(0.0837)		(0.1052)	
Fixed Price Parameter								
Price	-1.0474	***	-1.4397	***	-1.2747	***	-1.3055	***
	(0.1060)		(0.1324)		(0.1614)		(0.1944)	
Standard Deviation of Random Parameters								
Opt-Out	4.2677	***	4.1364	***	4.8522	***	4.7714	***
	(0.4393)		(0.4074)		(0.7320)		(0.7223)	
USA	0.5279	***	0.5204	***	0.0289		0.6749	***
	(0.1594)		(0.1715)		(0.2730)		(0.2413)	
Vietnam	0.5186	***	0.7955	***	0.8871	***	1.1845	***
	(0.1585)		(0.1684)		(0.2128)		(0.2563)	
Ecuador	0.0169		0.4734	**	0.1008		0.0690	
	(0.3229)		(0.2064)		(0.5625)		(0.4844)	
MSC	0.4331	***	0.4580	***	0.3164	***	0.2906	*
	(0.0757)		(0.0903)		(0.1210)		(0.1528)	
BPA	0.4140	***	0.3946	***	0.4349	***	0.6401	***
	(0.0798)		(0.0938)		(0.1095)		(0.1415)	
Heart-Healthy	0.2536	**	0.3050	***	0.3285	**	0.3599	**
	(0.1060)		(0.1164)		(0.1374)		(0.1728)	

N	260	260	127	126
Log likelihood score	-1198.82	-1196.03	-575.85	-571.21
McFadden R2	0.2971	0.2988	0.3215	0.3109

Notes:

*, **, *** denotes significance level of 90%, 95%, and 99% respectively

Estimated with NLOGIT 5.0, 3000 Pseudo Random Draws

Random Parameters were assumed to have normal distribution