Journal of Experimental Psychology: Applied
2011, Vol. 17, No. 4, 332–341

1076-898X/11/$12.00 DOI: 10.1037/a0024354

Partitioning Default Effects: Why People Choose Not to Choose

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Default options exert an influence in areas as varied as retirement program design, organ donation policy, and consumer choice. Past research has offered potential reasons why no-action defaults matter: (a) effort, (b) implied endorsement, and (c) reference dependence. The first two of these explanations have been experimentally demonstrated, but the latter has received far less attention. In three experiments we produce default effects and demonstrate that reference dependence can play a major role in their effectiveness. We find that the queries formulated by defaults can produce differences in constructed preferences and further that manipulating queries can also mitigate default effects. The experimental context involves two environmentally consequential alternatives: cheap, inefficient incandescent light bulbs, and expensive, efficient compact fluorescent bulbs. Within this context we also measure the impact of each potential rationale for a default effect.

keywords: defaults, query theory, decision making, preference construction

Many active decisions have a default option that is chosen more often than expected if it were not labeled the default. In activities as diverse as voting, getting a flu shot or heading to the gym, "no-action defaults" refer to what happens in the absence of choice; that is, not voting, not getting the vaccine, or staying home on the couch. No-action defaults often affect consequential life decisions such as choices of auto insurance (Johnson, Hershey, Meszaros, & Kunreuther, 1993) and retirement savings (Madrian & Shea, 2001) which affects how billions of dollar are spent, and policy matters such as organ donation, which affects thousands of lives (Abadie & Gay, 2006; Johnson & Goldstein, 2003). Since defaults, by definition, allow people to choose alternatives, they can both preserve freedom of choice and influence individual behavior, making them alluring components of policy creation (Thaler & Sunstein, 2008).

Why do default effects occur? Past research (Johnson & Goldstein, 2003; McKenzie, Liersch, & Finkelstein, 2006) has suggested that defaults may be chosen for three reasons. The first is effort: choosing the default option requires no physical action and can free one from laborious calculation. The second is implied endorsement: decision-makers may infer a default has been preselected due to its merit or the desires of those presenting the choice. Finally, defaults may result from reference dependence: the default option may represent a reference point which colors the evaluation of other options as gains or losses. This paper provides novel empirical evidence that (a) reference dependence can change the evaluation of options in a way that leads to default effects, and (b) it examines how various factors relate to the likelihood of choosing the default. We generate these hypotheses in the theoretical framework of Query Theory (Johnson, Haubl, & Keinan, 2007; Weber et al., 2007). That is, by manipulating aspects we can mitigate the default effect.

Isolating specific causes of the default effect is important for generating interventions to change the frequency of default-based choice. For example, if effort causes a default to be chosen more frequently, making execution of the choice easier should reduce default effects. Thus, when a policymaker or marketer presents a decision maker with a choice they should consider the effects of various defaults as well as understand their cause.

The experiments in this study examine participant's choices between either a cheap, but inefficient incandescent light bulb, or an efficient, but expensive compact fluorescent light bulb (CFL). This choice is, in aggregate, consequential. According to the EnergyStar program of the U.S. Environmental Protection Agency and the Department of Energy, if every home in America would switch just one incandescent bulb to a CFL it would "save enough energy to light more than 3 million homes for a year, more than $600 million in annual energy costs, and prevent greenhouse gases equivalent to the emissions of more than 800,000 cars." (EnergyStar, 2010).

We produce default effects in three experiments while measuring the impact of effort, implied endorsement and reference dependent choice. The first experiment examines the relative effects

This article was published Online First June 27, 2011.

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We thank participants at the Behavioral Decision Research in Management Conference at UCSD, and the conference Using Human Nature to Improve Human Life at the University of Chicago for helpful comments. Grant 5R01AG027934-02 from the National Institute of Aging to the second author funded this research.

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of these three explanations on the choice of a default option. The second experiment extends these results by introducing an external measure of effort. In the third experiment we control the queries shown to participants in order to test for a causal relationship between query consideration and choice. This experiment demonstrates that by managing the order and content of the queries the default effect can be managed.

Effort is measured by self-reports in Experiment 1 and by reaction times in Experiment 2. Implied endorsement is measured, as in McKenzie et al. (2006), by using the decision-makers' perceptions. The effect of reference dependence on the evaluation of the options is measured using an *aspect listing* protocol, a method that has been used to study the endowment effect (Johnson et al., 2007), attribute labeling (Hardisty, Johnson, & Weber, 2010) and intertemporal choice (Weber et al., 2007).

Causes of Default Effects

The role of effort in creating default effects has been widely discussed (Samuelson & Zeckhauser, 1988; Sunstein & Thaler, 2003; Thaler & Sunstein, 2008) and consists of two related ideas. The first is the physical effort of responding. Filling out a paper form, searching for a postage stamp, or collecting necessary documentation all could lead to increased selection of default options. The second is the effort associated with deciding what one wants. Without a preexisting preference, identifying the best option and underlying tradeoffs takes time that will also increase cognitive effort (Tversky & Kahneman, 1974). Implicitly, effort-based accounts either suggest that default effects matter most when the stakes are small, or that people do not fully compensate the effort of making a response with the importance of making the decision (McKenzie et al., 2006). One might attribute default effects to a kind of rational inaction, but given the large effects of defaults in consequential domains such as retirement savings, the hypothesis that the choice of the default represents an optimal allocation of effort seems unwarranted.

The implied-endorsement explanation suggests that decision-makers use the default to infer what the question's authors would recommend (Brown & Krishna, 2004; McKenzie et al., 2006). This account asserts that defaults are meant as advice giving by the question-poser on the part of customers and citizens.

We offer a third hypothesized cause, suggesting that defaults may act as *instant endowments*. That is, that the decision maker may act as if they have already chosen the default option and will consider it a reference point. Classically, the endowment effect leads to the hypothesis that individuals tend to value an object more when it is owned than when it is not owned (Thaler, 1980). As discussed in Park, Jun, & MacInnis, 2000, this can cause a perceived increase in value for the default option and may lead to shifts in perspective that can cause preferences to be constructed in predictable ways. Such shifts in the evaluation are often attributed to the combination of shifts of a reference point and loss aversion (Tversky & Kahneman, 1991). Loss aversion provides an accurate description of the pattern of choices, but does not provide an explicit psychological process that produces this pattern. More recent work (Carmon & Ariely, 2000; Nayakankuppam & Mishra, 2005) suggests that loss aversion may be generally linked with the construction of preferences, and more specifically with the retrieval of information about the options from memory.

We explore the ability of one specific memory-based view, Query Theory, to account for reference dependent preferences in defaults. Query Theory suggests that when individuals are making a decision they: (a) identify different arguments in decision making by making unique queries, such as generating reasons for or against owning a particular object; and (b) execute these queries sequentially. Further, because of output interference (Anderson, Bjork, & Bjork, 1994; Roediger, 1973), the order of executing these queries determines what is recalled, and consequently preferred. Specifically, the first query results in the retrieval of a greater number of reasons and, therefore, has more impact than the second query. When applied to the endowment effect, previous research (Johnson et al., 2007) shows that Query Theory supports the key claims that sellers (endowed with objects) and buyers (given a choice between receiving an object or cash) execute queries in different orders, and that output interference causes the second category to be impoverished relative to the first. For example, Johnson et al. (2007) show that sellers tend to initially list reasons that support keeping the object, and list such reasons in greater number. In contrast, buyers initially generate reasons that support keeping the money, also with greater number. These differences partially mediate the endowment effect, which can be eliminated when the order of consideration is reversed. Formally, these queries are labeled aspects as they each describe one aspect of any decision option. A positive aspect of one decision option is then a single query that is in favor of choosing that option whereas a negative aspect would be against choosing that option.

Finally, if Query Theory produces reference dependent preferences in default choices, we would predict that the existence of a default option will make queries in favor of that option be listed earlier and more often. Then, according to Query Theory there is support following two hypotheses:

(1) Order hypothesis: Participants are more likely to retrieve positive aspects of the default object and negative aspects of the nondefault object before considering negative aspects of the default and positive aspects of the nondefault.

(2) Content hypothesis: Participants are more likely to retrieve positive aspects of the default object and negative aspects of the nondefault object than to retrieve negative aspects of the default and positive aspects of the nondefault.

Following Hypotheses (1), a corollary would be that manipulating the order in which queries are requested will also affect the decision in a ways that can mediate a default effect. Further, we expect these differences in retrieval to both predict choice and to mediate the effects of defaults.

Experimental Design

Across all experiments we keep a common scenario (see Appendix 1) in which the participant must choose between compact fluorescent light bulbs (CFL) and incandescent light bulbs. The scenario describes renovations done at the participant's home where one of the bulb types has been installed, and thus becomes the de facto default. A contractor then offers the participant the opportunity to switch from the default bulb for no additional cost. Light bulbs are chosen as the focus of this study because of the associated energy savings from reduced electrical consumption. The participants are split into two groups with the default bulb depending on the condition. All three experiments have between-

participants conditions where the default bulb is either an incandescent or a CFL.

To investigate the query theory hypothesis, participants record thoughts (i.e., considered aspects of the choice) while making the decision. In Experiment 1 aspects are listed concurrently to determine how thoughts differ during the decision making process. In Experiment 2 aspects are listed retrospectively, which allows for measurement of choice decision time without the contaminating effort of aspect listing. Experiment 3 uses a 2×2 design varying the type of default bulb and aspect listing order. Varying aspect order means the subjects either list aspects for the default followed by aspects against the default, or the reverse order. This experiment allows for manipulation in the order and content of aspects listed. Following the light bulb scenario, participants completed a questionnaire to assess implied endorsement as well as demographics.

For the data analysis, we use a mix of categorical data and logistic regressions to estimate the likelihood of choosing the default option or type of bulb. That is, we have linear or multivariate regressions when the dependent variable is continuous and logistic regressions for binary dependent variables. In all experiments the dependent variable is choice but the mediating and independent variables differ. For mediation, we first calculate the impact of the independent variable on the mediator (a), the impact of the mediator on bulb choice (b), the joint impact of the independent variable and mediator on bulb choice ($a \times b$) and finally the impact of the independent variable on bulb choice while accounting for the mediator (c). As recommended by Zhao, Lynch and Chen (2010) and MacKinnon, Fairchild and Fritz (2007), if $a \times b$ is significant then there is evidence of mediation. As the mediating variables are continuous and the dependent variable is categorical we use bootstrapping methods to estimate confidence intervals for $a \times b$ (Shrout & Bolger, 2002; Preacher & Hayes, 2004). As referenced from MacKinnon, Fairchild and Fritz (2007), resampling methods "do not require as many assumptions as other tests, which is likely to make them more accurate than traditional mediation analysis."

Measures

Implied endorsement. Motivated by Experiment 4 in McKenzie et al. (2006), we asked each respondent to report their agreement on a 7-point Likert scale from -3 (*Strongly Disagree*) to $+3$ (*Strongly Agree*) with the following two statements (along with fillers) after their decision:

Direct implied endorsement. "I made my choice because the contractor appeared to want me to select that option."

External implied endorsement. "I made my choice because I thought about what most people would do."

Thaler and Sunstein (2008) suggest the default may reflect other peoples' choices and selecting the default reflects an imitation heuristic (Boyd & Richerson, 2005). As such, External Implied Endorsement reflects a slightly broader idea than suggested by McKenzie et al. (2006) which focuses primarily on Direct Implied Endorsement. Our test is similar to McKenzie et al.'s but allows a more direct assessment by determining if agreement with these statements is correlated with choosing the default option.

Ease of decision. In Experiment 1 we examine the effect of respondents' perception of effort on default taking. After McKenzie et al. (2006), we asked, as part of these questions, respondents to rate their agreement with this item: "I made my choice because it was easier to choose that option." In Experiment 2, we additionally record response time of the default decision.

Reference dependence. Query Theory's ability to explain reference dependent preferences is examined using the Order and Content hypotheses. We measure the order of the queries by taking the standardized median rank difference (SMRD; Johnson et al., 2007; Weber et al., 2007), which we will refer to as simply Order:

$$\text{Order} = 2 \times (\text{MR}_{\text{Non-Default}} - \text{MR}_{\text{Default}})/\text{n} \quad (1)$$

where $\text{MR}_{Default}$ = median rank of aspects (in the list of generated aspects) supporting the default or against the nondefault and $\text{MR}_{Non\text{-}Default}$ = median rank of aspects supporting the nondefault option or against the default option. The total number of aspects listed is n. Thus, Order will vary between -1 and $+1$, where a value of $+1$ implies that earlier aspects are about the positives of the default option, or negatives about the nondefault option.

The analogous measure to characterize differences in Content is defined as:

$$\textit{Content} = \frac{(POS_{Default} + NEG_{Non\text{-}Default}) - (POS_{Non\text{-}Default} + NEG_{Default})}{(POS_{Default} + NEG_{Non\text{-}Default}) + (POS_{Non\text{-}Default} + NEG_{Default})} \quad (2)$$

Where $\text{POS}_{\text{Default}}$ ($\text{NEG}_{\text{Default}}$) lists the number of aspects which are positive (negative) about the default option and $\text{POS}_{\text{Non-Default}}$ ($\text{NEG}_{\text{Non-Default}}$) lists the number of aspects which are positive (negative) about the nondefault option. Like Order, the Content variable will vary from -1 to $+1$, with $+1$ indicating a focus on the default and -1 a focus not on the default. Order and Content are expected to vary depending upon which option is the default, and we expect changes in Order and Content to mediate, at least partially, default effects.

Experiment 1

The focus of Experiment 1 is to assess the strength of the possible causes of the default effect in the light bulb scenario. Participants were assigned randomly into two groups with the default bulb being either an incandescent or a CFL. First, they read the scenario listed in Appendix A, but do not make a decision. Second, they list all aspects (i.e., individual thoughts) about the decision. Third, each submitted aspect is displayed back to the participant that submitted it, who codes it as either for CFLs, against CFLs, for incandescent bulbs or against incandescent bulbs. Fourth, participants are asked to choose between the bulbs. Fifth, the participants take a survey containing questions relating to implied endorsement measures, effort and demographics.

Experiment 1 had 209 participants drawn from a national, online panel of adults that is managed by the university. We excluded participants who did not follow directions as determined by inconsistent aspect listing and self coding: such participants gave overwhelmingly positive aspects for one choice, yet chose the opposite. Also, the fastest 5% of those finishing the survey were removed as they would not have had enough time to read the scenario. These two filters eliminate 9% of the participants, although the results

from the full sample are comparable. Respondents averaged 35 years in age, ranging from 18 to 65, with 68% female. Approximately 60% of the respondents were married or living with a partner, 33% single and 7% divorced, separated or widowed. There were no significant effects of gender, age, or marital status on default taking.

Results: Choice

There was a significant default effect: When CFLs were the default, respondents chose the incandescent bulb 20.2% of the time. When the incandescent bulb was the default, it was chosen more than twice as often as in the CFL default condition: 43.8% of the time, $\chi^2(1) = 12.30$, $p < .01$; see the left half of Figure 1.

Results: Causes of Default Effects

Implied endorsement and effort. Do the implied endorsement or effort measures predict the probability that a default is chosen? To test this we first use separate logistic regressions in which the dependent variable is the likelihood of choosing the default, and the independent variables are Direct Implied Endorsement, External Implied Endorsement and Ease of Decision. In none of these regressions is there a significant impact due to these independent variables: for Direct Implied Endorsement, $\chi^2(1) = 0.41$, $p = .52$; for External Implied Endorsement, $\chi^2(1) = 2.36$, $p = .12$; for Ease of Decision, $\chi^2(1) = 0.32$, $p = .57$. A multivariate logistic regression with continuous measures demonstrated the same result. As an alternative test we also perform a median split on implied endorsement and effort. In no case did the higher levels of Direct Implied Endorsement, External Implied Endorsement or Ease of Decision have an effect on choosing the default option.

Reference dependence. If reference dependence leads to a default effect, then we predict differences in both the Order and Content of respondents' aspect listings. Figure 2 confirms this for both measures, indicating that defaults change both Content, $F(1, 174) = 9.01$, $p < .01$ and Order, $F(1, 174) = 4.59$, $p = .03$ by a one-way ANOVA. As predicted, the advantages of CFLs tend to be listed first and in greater quantity in the CFL default condition whereas advantages of Incandescent bulbs tend to be listed earlier and in greater quantity in the Incandescent default condition.

Are these changes in the order and content of aspects associated with differences in choice? Figure 3 shows the likelihood of choosing CFLs as a function of a median split on both the Order and Content measures. The group that was CFL Skewed (i.e., that listed more thoughts for CFLs and against incandescent bulbs) chose incandescent bulbs only 6.2% of the time and the Incandescent Skewed group chose incandescent bulbs 53.6% of the time, $\chi^2(1) = 45.49$, $p < .01$ via a logistic model. For Order, the CFL Skewed group (listing thoughts for CFLs and against incandescent bulbs first) chose incandescent bulbs 9.3% of the time and the Incandescent Skewed group chose them 59.5% of the time, $\chi^2(1) = 50.60$, $p < .01$.

Finally, we test whether Order and Content mediate the relationship between the default situation and choice. Because Order and Content are continuous and choice is categorical we estimate confidence intervals for the joint impact ($a \times b$) with bootstrapping techniques (Shrout & Bolger, 2002). The impact of Default on Order (a) is 0.34 ($p = .07$), the Order on Choice (b) is 2.54 ($p < .05$) with a joint impact ($a \times b$) of 0.87 ($p = .07$). The direct impact of Default on Choice (c) is 0.95 ($p > .21$), which marginally demonstrates mediation for Order. The impact of Default on Content (a) is 0.34 ($p < .05$), Content on Choice (b) is 4.06 ($p < .05$) with a joint impact ($a \times b$) of 1.36 ($p < .05$). Finally, the

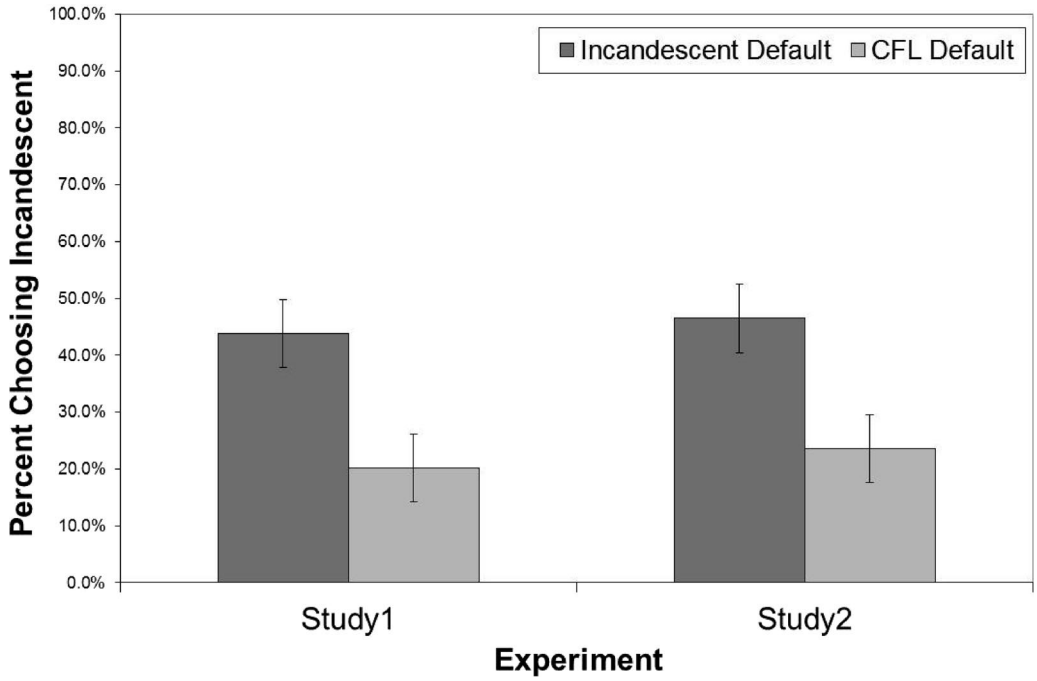

Figure 1. Experiment 1 and 2. Choice of light bulb type by default condition, Experiment 1 and 2.

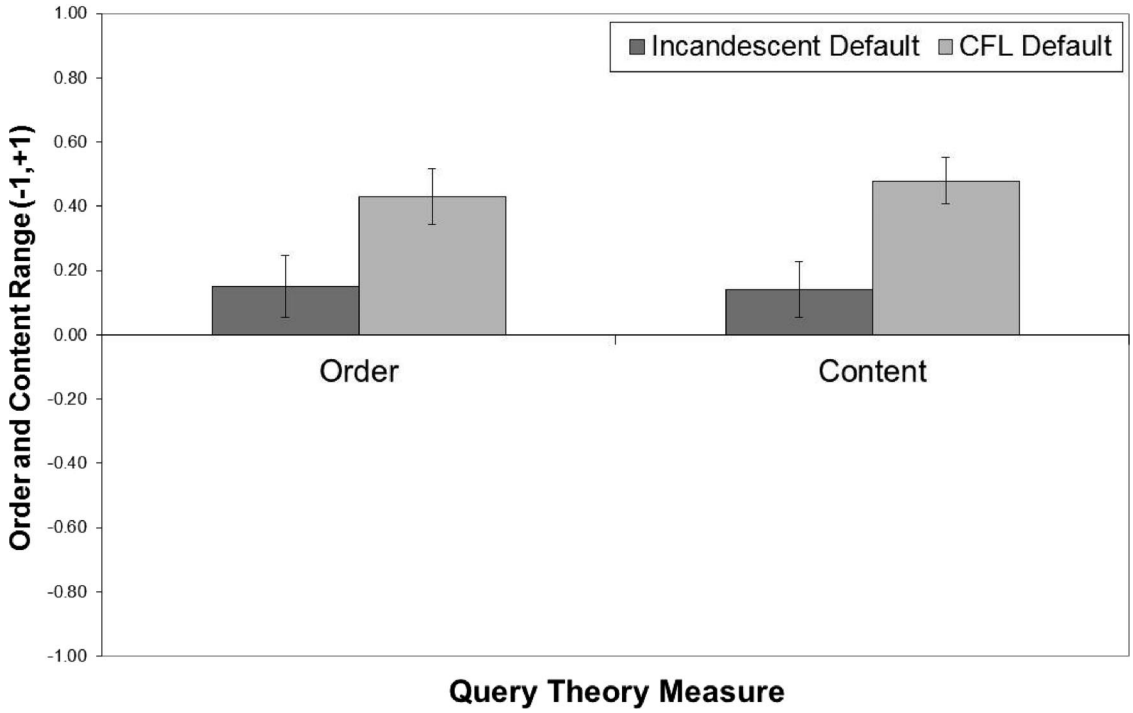

Figure 2. Experiment 1. Order (Equation 1) and content (SMRD, Equation 2) of aspect listings, by default.

relationship between Default and Choice (c) is 1.08 ($p = .22$), showing full mediation for Content (see Table 1).

In this experiment we first demonstrate that this scenario of bulb choice creates a strong default effect. Second, self reports of effort and implied endorsement, cannot explain this default effect. Third, listing of aspects partially mediates the relationship between default and choice. That is, for this scenario, the default condition (CFL or incandescent) impacts the thoughts generated, which in turn influence bulb chosen. This is correlation evidence of the mediating relationship of reference dependence on the default effect.

Experiment 2

Although Experiment 1 is able to simultaneously measure how implied endorsement and preference construction affect choice, it uses a self-report measure for effort. In Experiment 2 we extend to an external measure of effort, decision time. We use the same scenario in Experiment 1, but instead elicit aspects *after* the decision is made, thereby allowing direct measurement of effort without potential contamination from the aspect listing task. Participants first read the scenario and then make the bulb choices. After the decision, the participants list the aspects, which are again self-coded to avoid misinterpretation by external judges. Experiment 2 had 140 different participants drawn from the same online panel. After removing participants using the same standard as Experiment 1, 126 participants remained. Participants averaged 34 years in age, ranging from 18 to 65, with 66% female. Approximately 65% of the respondents were married or living with a partner, 30% single and 5% divorced, separated or widowed. There were no significant effects of gender, age, or marital status on default taking.

Results: Choice

As in Experiment 1, nearly twice as many respondents choose the incandescent bulb when it was the default: 23.6% of the participants given a CFL default chose to use incandescent bulbs but 46.5% of the participants with the incandescent bulb default chose Incandescent bulbs, $\chi^2(1) = 6.98$, $p < .01$, via a logistic model.

Results: Causes of Default Effects

Effort. The mean time required to make a choice was 42.9 seconds, with a maximum of 180 and minimum of six. Logistic regressions predicting default choice with (a) a linear term and (b) a linear and squared terms for continuous time on the probability of choosing a default, were not-significant, $\chi^2(1) = 0.48$, $p = .49$ and $\chi^2(2) = 0.11$, $p = .75$, respectively. The same analysis using a natural log-transformation of time returned similar nonsignificant results: $\chi^2(1) = 0.71$, $p = .40$ and $\chi^2(2) = 0.35$, $p = .55$, respectively. Thus, as predicted, the amount of time taken to make a choice was not a factor in choosing the default option in this experiment. We also consider the impact of time on default taking using a median split. The faster group (mean Time 22.8 seconds) chose the default 56.9% of the time, which was not significantly different from the slow group (mean Time 64.4 seconds), which chose the default 62.3% of the time, $\chi^2(1) = 0.38$, $p = .54$, via a logit model. In contrast to Experiment 1, the Ease of Decision statement did seem to have a significant relationship, $\chi^2(1) = 9.24$, $p < .01$ with default taking, providing mixed evidence for the self-reported measure.

Implied endorsement. A logistic model on the probability of choosing the default showed that neither Direct Implied Endorsement, $\chi^2(1) = 0.25$, $p = .61$ nor External Implied Endorsement,

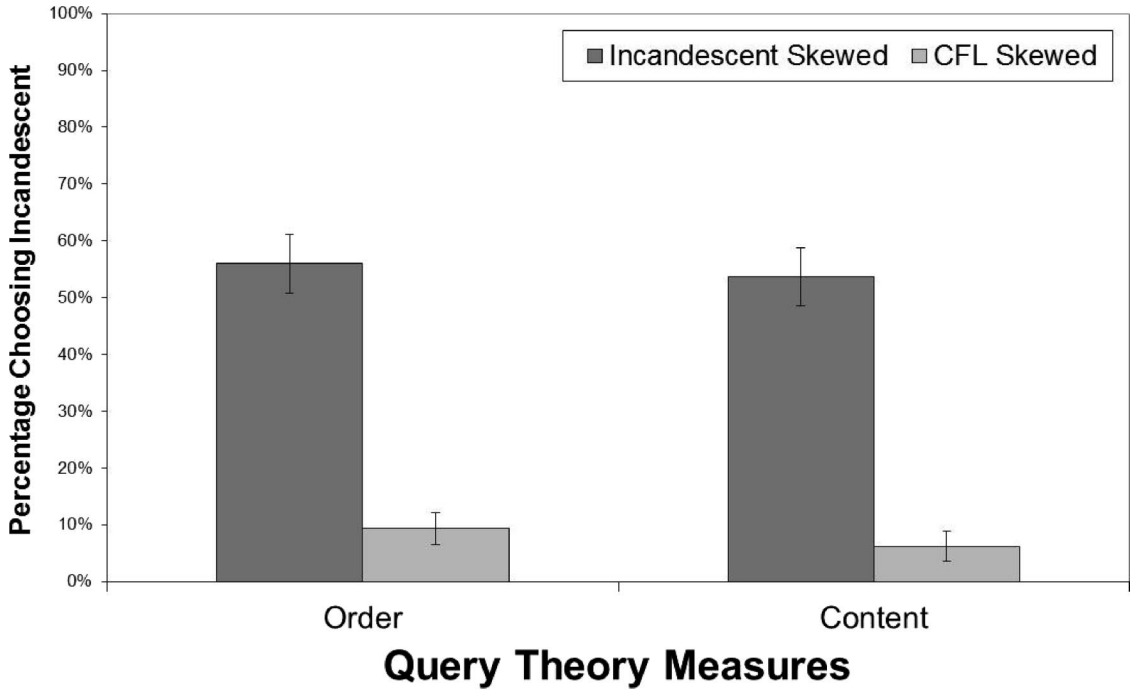

Figure 3. Experiment 1. Choice of incandescent option by order and content of aspect listing (median split).

$\chi^2(1) = 0.05$, $p = .82$ had a significant effect on likelihood of choosing a default.

Reference dependence. Consistent with the Query Theory account, defaults again influenced the Order and Content of the aspect listings, and these differences in Order and Content then affected choice. The mean Content measure is 0.18 for Incandescent defaults, and 0.45 for CFLs. For Order, the means are 0.13 and 0.43. These measures, drawn from retrospective aspect listings are similar to those obtained by concurrent listings in Experiment 1. Testing the differences for Order and Content across default conditions using a one-way ANOVA gives results that are consistent with Experiment 1, and marginally significant, with, $F(1, 110) = 2.60$, $p = .06$ and $p = .05$, $F(1, 110) = 2.82$, respectively.

We again estimate the impact of aspect Order and Content on bulb choice with median splits. The high Content group (listing more aspects for CFLs and against incandescent bulbs) chose incandescent bulbs 3.3% of the time while the low Content group chose incandescent bulbs 70.6% of the time, $\chi^2(1) = 80.39$, $p < .01$. The high Order (listing pro-CFL and against-incandescent reasons first) chose incandescent bulbs 4.6% of the time, and the low Order group chose them 76.1% of the time, $\chi^2(1) = 70.15$, $p < .01$.

Finally, we test if Order and Content mediate the relationship between the default situation and choice using bootstrapping to estimate confidence intervals (Shrout & Bolger, 2002). The impact of Default on Order (a) is 0.27 ($p < .05$), Order on Choice (b) is 1.89 ($p < .05$) with a joint impact ($a \times b$) of 0.52 ($p = .05$). The direct impact of Default on Choice (c) is 1.25 ($p < .05$), showing partial mediation for Order. The impact of Default on Content (a) is 0.33 ($p < .05$), Content on Choice (b) is 2.77 ($p < .05$) with a joint impact ($a \times b$) of 0.92 ($p < .05$). Finally, the relationship between Default and Choice (c) is 0.97 ($p < .05$), showing partial mediation for Content.

Simultaneous estimation. Last, we perform a logistic regression using all of the purported mediators (effort, implied and explicit endorsement, and loss aversion) as simultaneous predictors. As Order and Content are highly correlated (0.59), we use their sum as a measure of preference construction. The results of this model are shown in Table 2. This regression predicting bulb choice from default, time of decision, implied endorsement and preference construction shows, for this context, that only the combined Content and Order measure predicts choice significantly, $\chi^2(1) = 17.30$ $p < .01$. Further, it also shows no difference in the default effect across conditions, as well as how ease of decision is no longer a factor in the presence of preference construction.

In this study we expand and strengthen the results of Experiment 1 by altering the experiment to test for another measure of effort as a potential mediator of the default effect. That is, moving the aspect listing until after the choice allows for measurement of decision time without confounding for time spent writing down aspects. However, decision time and other measures of effort and implied endorsement are unable to explain this default effect while query theory linger as the sole mediator impacting choice. This result is strengthened by a logistic model where all potential mediators are considered simultaneously.

Experiment 3

In Experiment 3 we manipulate queries in a sequence that should alter the chances that either CFLs or incandescent bulbs are more likely to be chosen. Whereas Experiments 1 and 2 show a

Table 1
Mediation Test Results. This Table Shows the Results of Mediation Tests for Experiments 1–3. All Confidence Intervals Are Calculated Using 100K Draws

Experiment	1	1	2	2	3
Dependent Variable	Bulb Choice	Bulb Choice	Bulb Choice	Bulb Choice	Bulb Choice
Independent Variable	Default Condition	Default Condition	Default Condition	Default Condition	Focus Condition
Mediating Variable	Order	Content	Order	Content	Aspect Differential
a	0.34*	0.34**	0.27**	0.33**	1.21**
b	2.54**	4.06**	1.89**	2.77**	0.34**
ab	0.87*	1.36**	0.52**	0.92**	0.41**
c	0.95	1.18	1.25**	0.97**	0.13

* $p < .10$. ** $p < .05$.

link between aspect listings and choice, it does not establish causality. This experiment has a 2 × 2 design in which we place participants in 2 different Default conditions and also manipulate the order of queries, that is, Focus. In the CFL-Focused condition we first ask for all positive attributes of CFLs and negative attributes of incandescent bulbs. Next, the participants then list all positive attributes of incandescent bulbs and negative aspects of CFLs. Following the aspect listing the participants are asked to make a decision. In the Incandescent-Focused condition we reverse the order of queries. We label the conditions pairing bulb and focus as Consistent (e.g., CFL Focus and CFL Default) and the conditions pairing the opposite bulb and focus as Not Consistent (e.g., CFL Focus and Incandescent Default). In this design, we believe that the Not Consistent condition will substantially diminish or eliminate the default effect. In contrast, the CFL Focused condition will make CFLs a more common choice and the Incandescent Focused condition will make the incandescent bulbs a more common choice. In sum, we expect an interaction between the Consistent and the Not Consistent groups. As in Experiments 1 and 2, participants were drawn from an online panel. After removing participants using the same procedure as in Experiment 1, 126 participants remained.

Table 2
Experiment 2. Simultaneous Estimation of the Default Effect. This Table Presents a Logistic Regression Where the Dependent Variable is the Type of Bulb Chosen and the Independent Variables Include Theorized Causes for the Default Effect

Independent variables	Estimate	Std error	χ^2
Intercept	−1.811	1.558	1.35
Time of Decision	0.030	0.027	1.22
Ease of Decision	0.507	0.339	2.24
Direct Implied Endorsement	−0.709	0.694	1.04
External Implied Endorsement	0.096	0.748	0.02
Preference Construction	2.237	0.538	17.30*
Condition (1 = CFL)	0.574	0.689	0.69
Condition* Time of Decision	0.028	0.027	1.13
Condition* Ease of Decision	0.367	0.339	1.17
Condition* Direct Implied Endorsement	−0.509	0.694	0.54
Condition* External Implied Endorsement	0.587	0.749	0.62
Condition* Preference Construction	0.134	0.538	0.06

Note. Condition = 1 if in CFL is the default, and 0 if an Incandescent is the default.
* $p < .01$.

Results: Choice

The percentage of participants choosing incandescent bulbs in this experiment is shown in Figure 4a. In the Consistent condition, the default effect is larger than in Experiment 2, with 39% more participants choosing CFLs in the default condition; this is also significant in a logistic model, $\chi^2(1) = 9.8$, $p < .01$. In the Not Consistent condition, as predicted, there is no default effect and, as expected, the difference between bulb choices is not significant 7%, $\chi^2(1) = 0.41$, $p = .53$. Thus, reversing the order of queries eliminates the effect of defaults upon choice.

Mediation by Aspect Listing

To confirm that the Focus manipulation impacts choice by altering the way that aspect listings are constructed we perform a mediation analysis. We cannot examine mediation by Order in this experiment because it is manipulated. However, we can test that content of the aspects is consistent with theory. Therefore, we consider the difference in the number of aspects in favor of CFLs minus the number of aspects in favor of incandescent bulbs, which is labeled *aspect differential*. First, we consider the impact of Focus on aspect differential (a), which has a coefficient of 1.21 ($p < .05$). Second the impact of aspect differential on bulb choice (b) is 0.34 ($p < .05$) and the joint impact of Focus and aspect differential ($a \times b$) is 0.41 ($p < .05$). Finally, the direct impact of Focus on bulb choice (c), including aspect differential is 0.13 ($p = .75$) which shows aspect differential fully mediates bulb choice. Figure 4b shows how changing from the Consistent to the Not Consistent conditions in fact *reverses* the number of aspects listed.

Discussion

In three experiments we demonstrate that reference dependence and preference construction, as described by Query Theory, can play a primary role in the default effect phenomenon. Specifically, we show that by manipulating aspect consideration we can mitigate the default effect in this context of bulb choice. However, given the size, robustness and ubiquity of default effects, we think it is unlikely that any one of the three proposed causes can explain the default effect across all situations. It is probable that all contribute at times, with the strength of each depending on the

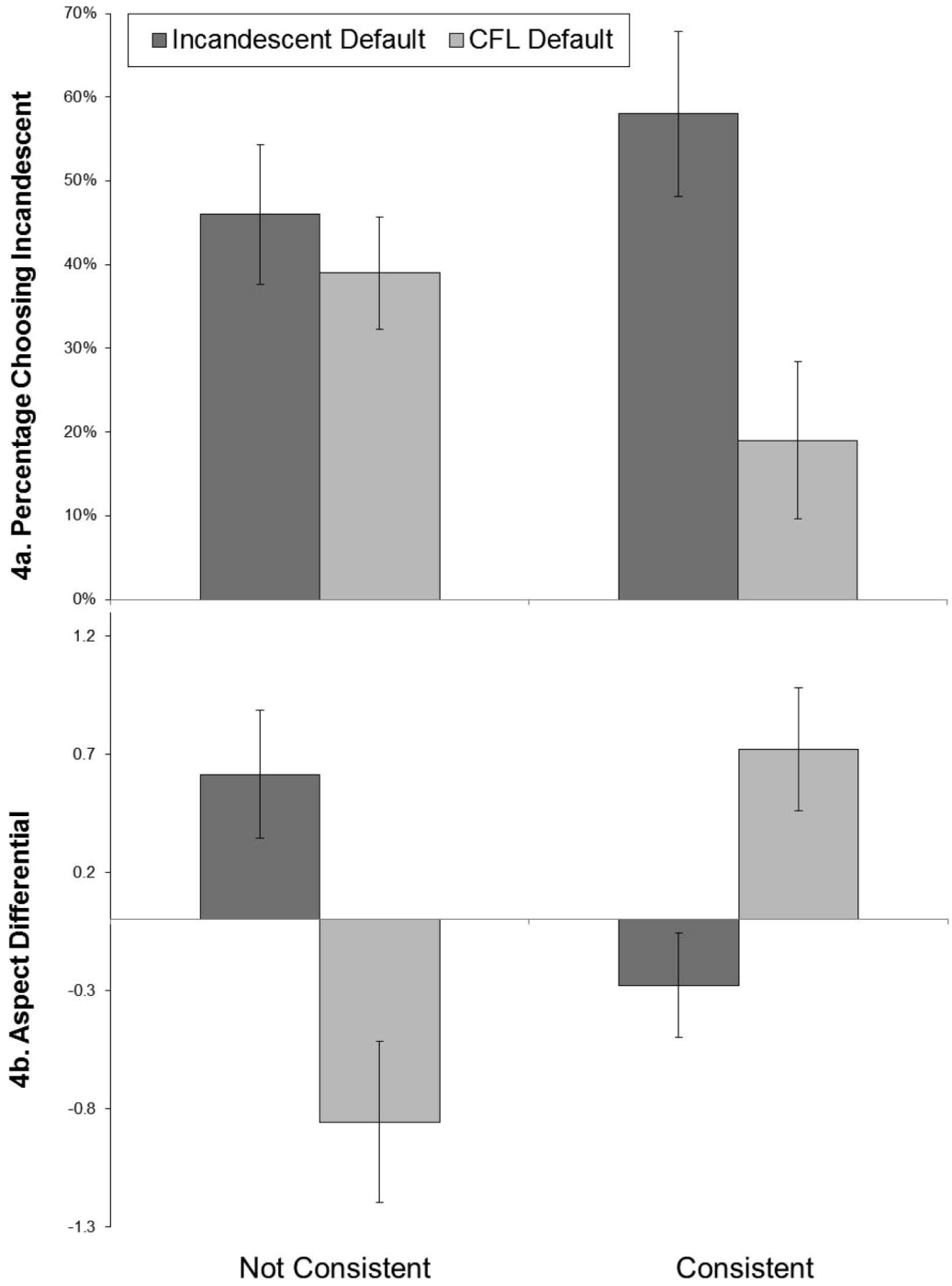

Figure 4. a: Experiment 3: Choice of incandescent option by default condition and bulb focus. b: Experiment 3: Aspect differential by bulb focus and condition.

situation. For example, although in this particular scenario reference dependence seems paramount, it is clear that implied endorsement (McKenzie et al., 2006) and effort can also play a critical role.

Even though there is a clear need for further applied research examining the contribution of each cause in specific applications, some guidelines seem apparent. Effort is most likely to have an effect when choosing a preference is difficult. That is, if choosing a decision takes a large amount of time, physical or cognitive effort may all impact the size of a default effect. In these experiments we measure time of decision and self-reports of effort but further experiments could also manipulate cognitive effort.

We expect implied endorsement to loom large when the options have great social significance as demonstrated in McKenzie et al.

(2006). For example, the Kansas Board of Education recently changed the default for taking sex education classes to an opt-in from an opt-out choice ("Kansas Children Must 'Opt-In' for Sex Ed," 2006). To parents, this may serve as an indication of the Board's perception of the classes. Consequently, implied endorsement may have large effects in such contexts.

Also, we expect that reference dependence will have an impact when options are relatively unknown but there is no constraint due to effort or impact from social factors. However, while using a consistent scenario across studies provides a stable platform for Query Theory's impact it does limit us from providing a generalizable result and is only conjectured to apply in other situations.

The addition of Query Theory as a tool for understanding default effects serves to extend the application of this memory-based account of preference construction. The results of these three studies bear a strong similarity to Query Theory accounts of attribute framing, intertemporal choice and endowment. That is, the way queries are processed may be generalizable to more situations. One interesting empirical extension of the current work would be to consider individual differences in prior beliefs about the domain. Recent work looking at attribute labeling (Hardisty et al., 2010) has suggested that the effect of queries depends critically upon the mental representation of the issue by the decision-maker. It is quite possible that in some domains people may differ markedly, and that the effect of defaults would depend on these differences.

We should also emphasize that the causes of default effects are not of simply academic interest to psychologists. Policymakers are choice architects (see Thaler & Sunstein, 2008), and as such should take into account how defaults will influence the real effects of policies. The question of how to choose default settings depends critically upon why default effects occur. For example, if a default effect is due to effort, then effort reduction is the suggested treatment and the default should be set to match the choice that would be made in the absence of a default. If the cause is implied endorsement, then this suggests that policymakers should either endorse the proposed defaults explicitly or clarify to the public that defaults are not recommendations. Finally, if default effects are due to preference construction, choosing the right default depends upon the policymaker's ability to predict which option is likely to yield the greater experienced utility.

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Appendix

Appendix A

Imagine that you are undergoing a significant amount of remodeling on your home. On the last day of work the contractors clean up all leftover dust, dirt, and paint. Before leaving, one of the workers tells you that the head contractor will be back tomorrow for a final inspection of the house.

Tomorrow evening the head contractor comes by your home to discuss the last aspects of the addition. After showing you one of the newly installed light fixtures he mentions that all 18 bulbs in the new fixtures have been outfitted with incandescent bulbs, which cost a total of $9. He then asks you if these bulbs are ok, or if you would prefer Compact Fluorescent (CFL) bulbs which will cost $54. If you prefer to switch, he will send over a contractor to switch the bulbs tomorrow. There will be no labor charge for switching the bulbs.

	You Now have:	You may switch to:
	Incandescent Bulb  (60 Watts)	Compact Fluorescent Bulb  (14 Watts)
Attributes	- Light quality is often considered "warm" or "soft." - Full brightness arrives immediately. - Turning bulbs on and off won't affect lifetime of incandescent bulbs - Incandescent bulbs can be disposed of anywhere - Bulbs last roughly 750 hours - Costs $49 in electricity per 10,000 hours.	- Light quality is sometimes considered "cold" or "bluish" - Full brightness takes 1-3 minutes to achieve - Lifetime of a CFL bulb is *significantly* shortened if it is only turned on a few minutes at a time. - Contains Mercury, so must be disposed of with caution. - Bulbs last up to 10,000 hours - Costs $11 in electricity per 10,000 hours of use
Cost	$0.50 per bulb $9 Overall	$3.00 per bulb $54 Overall

In this situation what will you do?

Choose only one of the following

◉ I will tell the contractor to leave the Incandescent Bulbs
○ I will tell the contractor to switch to Compact Fluorescent Bulbs

Received July 1, 2009
Revision received April 15, 2011
Accepted April 25, 2011 ■
see p. 432 for a correction to this article.

Correction to Dinner et al. (2011)

The article "Partitioning Default Effects: Why People Choose Not to Choose," by Isaac Dinner, Eric J. Johnson, Daniel G. Goldstein, and Kaiya Liu (*Journal of Experimental Psychology: Applied*, Advance online publication. June 27, 2011. doi: 10.1037/a0024354) contained an incorrect Figure 4. Additionally, the article was missing keywords. All versions of this article have been corrected.

DOI: 10.1037/a0026470