

Information Asymmetries in Default Options

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Default options can convey information relevant to making a default decision. This paper documents a curious information asymmetry: Automatic enrollment defaults (where individuals opt-out of a program) are often thought to convey information about what policymakers think, whereas non-enrollment defaults (individuals opt into a program) are usually viewed as uninformative. This information asymmetry arises because of a difference in the reasons imputed to policymakers when choosing automatic enrollment versus non-enrollment. Because people presume that inaction should be the default unless there is a good reason for doing otherwise, automatic enrollment defaults are more likely than non-enrollment defaults to communicate information about a policymaker's reasons. Individuals assess what these reasons might be, and use these assessments to arrive at a default decision. Four experiments and one field study provide support for this framework.

Keywords: default effects, decision making, information leakage, libertarian paternalism

Much of public policy is predicated upon individual choice. Individuals decide what foods to eat, what medical procedures to pursue, what occupations to undertake, and how to save for retirement. But people do not always actively decide, even in instances where a decision must be made. In such cases a third party often sets a *default option*, a designated course of action for those who fail to explicitly choose for themselves.

In one sense, the default option should be trivial whenever transaction costs are minimal. Its selection, after all, does not typically alter the economic fundamentals surrounding a choice — regardless of the default the set of available choices are usually the same as are the probabilities associated with those choices (Sher & McKenzie, 2011). Nevertheless, default options exert a dramatic influence on behavior. Compared to the non-enrollment default, governments that presume citizens as willing organ donors have markedly higher donation rates (Abadie & Gay, 2006; Johnson & Goldstein, 2003); companies with automatic 401(k) enrollment have more employees who save for retirement (Madrian & Shea, 2001); cities with “green” electricity defaults have lower energy usage (Pichert & Katsikopoulos, 2008); and states with limited tort default have drivers who pay lower insurance premiums (Johnson, Hershey, Meszaros, & Kunreuther, 1993). Default effects have also been observed in the use of advanced medical directives, internet privacy preferences, legal contracts, medical vaccine adherence, and even for how psychologists choose to analyze their data (Bellman, Johnson, & Lohse, 2001; Chapman, Li, Colby, & Yoon, 2010; Fabrigar, Wegener, MacCallum, & Strahan, 1999; Johnson, Bellman, & Lohse, 2002; Korobkin, 1998; Kressel, Chap-

man, & Leventhal, 2007; Young, Monin, & Owens, 2009).

This paper provides one explanation for why defaults exert such an undue influence on behavior. The central idea is that a default option is taken as a signal of a policymaker's *reasons* for acting. Because policies are chosen by policymakers — agents with their own set of motives, goals, and beliefs — the default option is often presumed to be selected for goal-directed reasons. Individuals assess what these reasons might be, and use these assessments to inform their decisions. Furthermore, defaults that automatically enroll participants into a course of action are especially informative because of the common presumption that inaction should be the default unless there is a good reason for doing otherwise.

Default Effects: An Overview

Default effects are thought to occur for at least three reasons (Johnson & Goldstein, 2003). The first explanation centers around the idea of behavioral inertia. To the extent that people fail to recognize, do not care¹, or procrastinate in making a decision, they stay with the default option. Inertia is the most basic explanation and likely accounts for the largest proportion of variance in default behavior. In one field study employees introspected about their retirement savings

¹A related explanation is that the direct transaction cost of leaving the default option exceeds the marginal benefit for any of the alternative options. In such cases it is not necessarily that individuals are indifferent to the choice, but have made a rational assessment that taking action is more effort than it is worth. For the purposes of this paper, we focus on those default effects that arise when direct transaction costs are negligible.

decisions, and approximately 73% of the individuals exhibiting default behavior reported doing so for reasons related to behavioral inertia (J. R. Brown, Farrell, & Weisbenner, 2011). Apparently, default behavior often reflects the simple fact that people fail to act.

A second explanation for default behavior is that people show a bias towards staying put (Baron & Ritov, 1994; Samuelson & Zeckhauser, 1988). This status-quo bias is generally thought to occur because choice is constructed around a salient reference point from which individuals partition the world into gains and losses, with losses weighted more heavily than gains. So when contemplating a choice, the pain of giving something up looms larger than the prospects of getting something in return, resulting in a premium for the current state of affairs (Kahneman, Knetsch, & Thaler, 1991). Since people usually take the default as their reference point, they think in ways that systemically bias them towards staying with the default option (Dinner, Johnson, Goldstein, & Liu, 2011, see also Dhingra et al., 2012).

A final explanation, and most relevant to the current research, is that defaults serve a signaling function by communicating information relevant to making a default decision. For example, a default may indicate what is recommended by the policymaker or reflect what most individuals prefer (McKenzie, Liersch, & Finkelstein, 2006). In the field study described earlier, where employees provided explanations for their retirement savings decisions, 20% of those who stayed with the default reported doing so because they saw it as an endorsement by their employer (J. R. Brown et al., 2011). Unlike behavioral inertia and status-quo bias, a signaling account focuses on the inferences that people make in explaining a policymaker's choices.

That defaults communicate information is also consistent with a broader research program documenting "information leakage" from logically equivalent frames (Sher & McKenzie, 2006). The general thrust of this research is that in many conversational settings audience members take an active role in gleaning information from a speaker's (e.g., policymaker) choice between equivalent frames (e.g., selecting a default option). For instance, when a doctor chooses to frame a treatment by its survival rate rather than its mortality rate, she may be tacitly signaling to the patient that the treatment is relatively efficacious — that the option is an improvement over, say, the alternative treatment. The doctor's choice of frame *leaks* information about her reference point and, more generally, her attitude about the treatment (McKenzie & Nelson, 2003; Sher & McKenzie, 2006). Default options operate in a similar way, leaking information about implicit advice.

A "Stickiness Premium" for Automatic Enrollment

The influence of defaults as signals becomes clear when examining the impact of different types of defaults on behavior. Take the basic distinction between *automatic enrollment* and *non-enrollment* defaults. Automatic enrollment presumes a specific course of action whereas non-enrollment presumes inaction; in the absence of an explicit preference, only automatic enrollment alters an individual's state of affairs. While both types of defaults have a pronounced effect on behavior, the existing evidence suggests that automatic enrollment is especially sticky. For example, Madrian and Shea (2001) examined employee 401(k) contribution rates at a large U.S. company where the retirement savings default was changed from one of non-enrollment to one of automatic enrollment. The primary finding was that the default had a huge effect on savings behavior, but more relevant here was that older employees (hired under the non-enrollment default) who selected a savings plan *after* automatic enrollment was introduced also tended to choose the new default savings rate (a 3% savings rate, completely allocated to a money-market fund). As a result, the percentage of employees displaying a preference for the default option rose under automatic enrollment. After controlling for the distribution in ex-ante preferences between the two policies, Madrian and Shea estimated a 12% "stickiness premium" for automatic enrollment over non-enrollment. Additional studies have found a similar pattern, with heightened default behavior under automatic enrollment (Agnew & Szykman, 2005; Choi, Laibson, Madrian, & Metrick, 2004; Vanguard Center for Retirement Research, 2001).

What makes these findings notable is that they cannot be easily explained by appealing to behavioral inertia or status-quo bias explanations. Holding the initial distribution in preferences between two policies constant, subjects should be equally inert and equally biased towards the status-quo. Madrian and Shea speculated that this stickiness premium probably occurs because employees were particularly likely to view automatic enrollment as an implicit recommendation from the company. Experimental support for this claim comes from McKenzie et al. (2006), who probed for default inferences using hypothetical policies and found evidence for exactly this sort of information asymmetry. When presented with policy defaults for organ donation and retirement savings, participants mainly drew inferences of implicit advice from automatic enrollment defaults. When the default was one of non-enrollment, most participants claimed that the default simply did not speak to policymaker's beliefs. Although McKenzie et al. were interested in establishing the more general point that defaults signal implicit advice, they found evidence for an information asymmetry — a finding consistent with the stickiness premium for automatic enrollment.

The question of why an information asymmetry arises,

however, is unclear. Using existing accounts of information leakage — that the default option reveals information about a policymaker's reference point (McKenzie & Nelson, 2003) or attitudes towards the policy (Sher & McKenzie, 2006) — fails to explain why non-enrollment defaults are *not* viewed as implicit suggestions. In other words, the fact that logically equivalent frames leak information does not explain why one frame leaks more information than another. So even if an information asymmetry explains why automatic enrollment defaults are especially sticky, it begs the question of why the information asymmetry arises in the first place. In this paper we propose that automatic and non-enrollment defaults convey different information about a policymaker's reasons for choosing a particular policy.

Inferring Reasons from Choices

We start with the working assumption that people explain public policies, including default options, the same way they explain most behavior — by appealing to reasons. Referencing an agent's subjective reasons for acting is the predominant way that people explain both the behavior of others and themselves (Heider, 1958; Malle, 2004; Shafir, Simonson, & Tversky, 1993). Furthermore, people recognize that others search for reasons when making sense of their decisions and factor such attributional implications into the decision making process (Medin, Schwartz, Blok, & Birnbaum, 1999). Because policy decisions are especially consequential, it is likely that people expect policymakers to have cogent reasons for their decisions and that policymakers would understand this.

More to the point, people may presume that some defaults are only implemented when there is a strong reason for doing so, and this is probably the case for automatic enrollment. Only automatic enrollment defaults have the potential to alter an individual's state of affairs — in the absence of choice, they move people *into* something — and actions that alter the status-quo require stronger reasons than those that maintain it (Baron & Ritov, 1994). This reluctance to engage in action is amplified when decision makers are held accountable for their choices (Tetlock & Boettger, 1994) and when decisions are made by committee (White, Hafenbradl, Hofrage, Reisen, & Woike, 2011), two often-present conditions when implementing public policy. Furthermore, automatic enrollment defaults are less common than non-enrollment (Madrian & Shea, 2001; McKenzie et al., 2006), and uncommon events tend to demand justification in a way that ordinary events do not (Weiner, 1985). It seems unlikely that policymakers would set automatic enrollment defaults without strong reasons² for doing so, and citizens probably intuit this to be the case.

By contrast, non-enrollment defaults leave people as they are, so enacting them should require less compelling reasons. They may be in place because policymakers perceive non-

action as the norm (Thaler & Sunstein, 2003); because policymakers are uncertain about what option is best, and stick with doing nothing (Tetlock & Boettger, 1994); because of accountability concerns for changing an individual's state of affairs (DeScioli, Christner, & Kurzban, 2011); or because policymakers never made an active decision in the first place (Kordes-de Vaal, 1996). In the absence of strong reasons for choosing one default over another, non-enrollment is usually the default option for setting a default option. And since non-enrollment defaults lend themselves to multiple explanations, they are less likely to convey information about what policymakers think (Morris & Larrick, 1995).

The information asymmetry in default options naturally follows from the difference in reasons for choosing them. If policymakers are thought to have "good reasons" for choosing the default — that *this* particular option was optimal for most individuals, and was chosen as the default for *this* reason — then people will view the default as an implicit recommendation as a matter of course. Defaults that are implemented with no particularly compelling reason in mind, on the other hand, simply do not speak to what a policymaker endorses or recommends. Reasons serve as the basis for making a default inference, and automatic enrollment defaults are presumed to have strong reasons behind them.

A reason-based framework also complements previous work on information leakage. Take the earlier example where a doctor frames an effective treatment by its survival rate rather than its mortality rate (McKenzie & Nelson, 2003). Implicit in this analysis is that the speaker selected the positive frame for a relevant reason: the doctor believed that the treatment was effective relative to other options, and more effective medical treatments should be preferred to less effective ones. More generally, Sher and McKenzie (2006) defined information leakage as any instance where a relevant background condition *C* varies according to a speaker's choice of frame (i.e., $p(\text{speaker chooses frame A} | C) > p(\text{speaker chooses frame B} | C)$). A reason-based framework specifies how individuals conceptualize *C*, namely as a speaker's goal-directed reasons for choosing that frame.

²This contention is also consistent with recent legislation on retirement savings policy. In 2006 the U.S. government passed the Pension Protection Act (PPA), considered one of the largest reforms to pension legislation in decades (see Beshears, Choi, Laibson, Madrian, & Weller, 2010). The PPA was partly designed to encourage employers to structure defined contribution saving plans more aggressively through the use of automatic enrollment defaults, and this enticement was done by reducing legal liability for potential losses resulting from such plans (given that other requirements were also met, such as exposure to more than one asset class). This enticement obviously assumes that employers are not selecting automatic enrollment saving plans partly because of risk-aversion, which is consistent with the behavioral evidence reviewed here.

An Informal Formalization

More precisely, we can think of the asymmetry in reasons as a kind of *information bottleneck*, where defaults represent signals that are more or less efficient in conveying information about states of the world (Skyrms, 2009). To illustrate this point, imagine a situation where the state of nature takes one of three forms: policymakers have a goal-directed reason to select automatic enrollment (N_1), a goal-directed reason to select non-enrollment (N_2), or are completely unsure what default option is optimal (N_3). The default option represents the signal, and given two such signals (automatic and non-enrollment) the set of signals cannot uniquely map onto the states of nature. If subjects assume that policymakers chose automatic enrollment under N_1 , and non-enrollment under N_2 , then beliefs about the policymaker's preferences under N_3 determines the partitioning of the states. As we argued in the previous section, the empirical evidence suggests that policymakers are presumed to chose non-enrollment in the absence of strong reasons for preferring one default over another (i.e., $p(\text{non-enrollment}|N_3) > p(\text{auto enrollment}|N_3)$). The stronger the bias, the more the states are partitioned by the signals; and the more the states are partitioned by the signals, the greater the magnitude of the information asymmetry.

Thinking of the asymmetry in this way also allows for a concrete definition³ of information, namely the degree that a signal maps onto the states of nature (in our case, a policymaker's reasons). Just as important, this definition establishes what the information asymmetry is *not*. First, the informativeness of a default is not synonymous with the meaning that subjects impart to the default option. Here, informativeness represents the degree that defaults map onto a policymaker's reasons, but do not necessarily speak to the content of those reasons. The meaning of the signal will instead be determined by factors such as prior beliefs or the nature of the relationship between the policymaker and the citizen. To illustrate this point, consider an individual who distrusts the policymaker and views their policies as negatively correlated with their own welfare. In this case the individual should still view automatic enrollment as more informative than non-enrollment so long as $p(\text{auto enrollment}|N_3) > .5$, but should make use of that inference by *leaving* the default. Put differently, in such cases individuals still think policymakers have strong reasons for choosing the default ("this company chose to automatically enroll me into a plan for a reason ...") but do not see those reasons as compatible with their interests ("...and that reason may very well be to screw me out of my money"; also see Friestad & Wright, 1994). In situations of high and low trust the meaning of an automatic enrollment default are in marked contrast to one another, even when the amount of information provided by the default remains the same.

A second point is that the information provided by a

default is distinct but not independent from its impact on choice. Informativeness represents the degree a signal changes beliefs about the states of nature, whereas a signal's impact on behavior can be measured by the degree it affects probabilities for acts (i.e., default behavior), namely $p(\text{act}|\text{signal})/p(\text{act})$. As the example of high and low trust situations illustrate, the direction of the act (staying with or leaving the default) should be determined by the meaning of the signal. However, the informativeness of the signal places an upper bound on a signal's impact⁴ on behavior. Stated another way, an uninformative default will not impact behavior because it does not distinguish between the different states, whether trust is high or low. On the other hand, an informative default that distinguishes the states of nature will impact behavior in different ways depending on the nature of the relationship between the policymaker and the citizen.

These two observations allow us to make a novel prediction about how trust impacts default behavior. If the basic information asymmetry holds, then we can also expect that trust should matter more for automatic enrollment than for non-enrollment. For automatic enrollment, we should expect to see pronounced default behavior when trust is high and modest default behavior (perhaps even anti-default behavior) when trust is low. Such a swing in behavior for non-enrollment, on the other hand, should be less dramatic because it conveys less information in the first place. This prediction is directly tested in Study 4.

³We can quantify the amount of information provided by a default, in bits of information, using a conventional measure of information gain (Kullback-Leibler distance, or D_{KL} ; Kullback & Leibler, 1951). This measure represents the weighted average of information about the states of nature provided by a signal (i.e., default option):

$$D_{KL} = \sum_i p(\text{state}_i | \text{signal}) \log_2 \left[\frac{p(\text{state}_i | \text{signal})}{p(\text{state}_i)} \right]$$

⁴More precisely, there exists a monotonic relationship between a signal's informativeness and its impact on behavior, so long as states influence behavior at a constant rate. That is, for any state of nature given two distinct signals i and j ,

$$\text{if } \log_2 \frac{p(\text{state}|\text{signal}_i)}{p(\text{state})} \geq \log_2 \frac{p(\text{state}|\text{signal}_j)}{p(\text{state})}, \text{ then}$$

$$\frac{p(\text{act}|\text{signal}_i)}{p(\text{act})} \geq \frac{p(\text{act}|\text{signal}_j)}{p(\text{act})}.$$

Assuming that states influence behavior at a constant rate K (i.e., $p(\text{state}|\text{signal}) = K(\text{act}|\text{signal})$), the monotonicity follows from

$$\log_2 \frac{p(\text{state}|\text{signal}_i)}{p(\text{state})} \geq \log_2 \frac{p(\text{state}|\text{signal}_j)}{p(\text{state})} \Rightarrow$$

$$Kp(\text{act}|\text{signal}_i) \geq Kp(\text{act}|\text{signal}_j) \Rightarrow \frac{p(\text{act}|\text{signal}_i)}{p(\text{act})} \geq \frac{p(\text{act}|\text{signal}_j)}{p(\text{act})}$$

Overview of Studies

Our reason-based framework hypothesizes that people read into automatic and non-enrollment defaults differently. Individuals presume that automatic enrollment is only chosen when policymakers have strong reasons for doing so (“policymakers must have had a good reason for choosing this, otherwise they wouldn’t have chosen it”). Individuals assess what these reasons might be, and then use this information as an input into making a default decision. Non-enrollment, on the other hand, is presumed to be the standard choice whenever policymakers are uncertain or lack clear reasons for choosing one default over another. As a result, individuals view them as less informative about a policymaker’s reasons and beliefs.

Four studies examine various facets of this framework. In Study 1 we unpack the information asymmetry by examining the different inferences subjects draw from each default option (i.e., how defaults are thought to map onto various states of the world). Study 1 probes for inferences both helpful and unhelpful in making a default decision, allowing us to determine whether automatic enrollment defaults are in fact viewed as efficient signals about those states of nature relevant to making a default decision. Study 2 examines the underlying mechanism giving rise to the information asymmetry, and generalizes this mechanism to policies beyond automatic enrollment and non-enrollment. Study 3 rules out an alternative explanation for the information asymmetry, namely that automatic enrollment is more informative because it usually represents an active departure from past policy. The final study describes a field experiment examining the role of default inferences on default behavior, and how feelings of trust in the policymaker moderate this process.

Study 1

Study 1 begins by unpacking the information asymmetry between automatic enrollment and non-enrollment. Currently the most direct evidence for an asymmetry comes from McKenzie et al. (2006), where participants read scenarios of policymakers actively selecting a default option. In these studies policymakers considered both automatic enrollment and non-enrollment, and ultimately selected one or the two defaults (the policy domain was organ donation or retirement savings, depending on the study). When participants were later asked to make inferences from the default option, most inferred implicit advice if policymakers had selected automatic enrollment but viewed the default as uninformative if policymakers had selected non-enrollment.

The experiments by McKenzie et al. are an important first step in examining default inferences, but have several limitations. First, in these studies both the scenario and follow-up questions made it clear to participants that policymakers

actively deliberated when choosing a default option. While this does not explain the different inferences made for automatic and non-enrollment defaults, it calls into question whether subjects would make any inferences at all if information about the choice was not made explicit.

A related point is that the policymakers’ menu of options were presented jointly to each participant. This design may have questionable ecological validity because individuals normally confront a default decision in isolation, rather than alongside all possible alternatives. Furthermore, audience members are most adept at correctly inferring a speaker’s (e.g., policymaker) intentions when they are jointly presented with the different frames available to the speaker (Van Buiten & Keren, 2009). So even if concerns about perceptions of choice are alleviated, it is unclear whether participants would realize the full extent of that choice had they been unaware of the alternatives available to the policymaker. Study 1 therefore builds upon this research by testing for the information asymmetry using a more conservative research design: Participants were presented with a single default policy, and in a manner that did not imply the default was actively chosen by policymakers.

Methodological concerns aside, Study 1 also aims to provide finer resolution on the nature of the asymmetry. When participants in the experiments by McKenzie et al. reported that the default was uninformative, it was unclear exactly why the default was viewed as uninformative. According to our framework, an uninformative default is one that maps onto those states of nature irrelevant to making a default decision. Accordingly, we probed both for inferences that would be useful in making a default decision (*choice-relevant information*) and those that would be less useful in making a decision (*choice-irrelevant information*). If only non-enrollment defaults are viewed as diagnostic of instances irrelevant to making a default decision then this would provide evidence as to why they are also viewed as uninformative (i.e., because they are seen as inefficient signals).

Methods

A sample of 74 adults were recruited from Amazon.com’s Mechanical Turk service (MTurk) in return for a small cash payment. Using the service’s built-in screening criteria, only U.S. users were allowed to participate. Seven participants were excluded because they failed to correctly answer a comprehension check asking them to identify the default option; including these participants in the analysis does not substantively change the results. The final sample of 67 participants had slightly more women than men (60% female) and an average age of 36 years (range: 18–67 years).

Participants read about an unnamed company and were randomly assigned to one of two conditions. In the *enrolled* condition, the company automatically allocated a fraction of an employee’s wages to a retirement savings plan but em-

Table 1
Items and factor loadings for Study 1

	Factor 1	Factor 2
1. Company officials made a conscious, deliberative decision in choosing this as the default option. (reverse scored)	-.03	.81
2. Company officials did not give this policy much thought at all, and this became the default option as a result.	-.09	.82
3. Company officials thought that their employees would be better off staying with the default option.	.75	.00
4. Company officials thought the default option would be in the best interests of their employees.	.90	-.12
5. Company officials thought the default option would be well suited for most employees in the company.	.90	-.18
6. Company officials thought the default option would be what most employees would probably choose anyway.	.84	.08
7. Company officials were playing it safe — they thought this default option would be the least likely to get them into trouble if something went wrong.	-.08	.59
8. Company officials were completely unsure what would be best for employees, and this was what ended up being the default option.	-.23	.49

Note: Factor loadings above .40 are shown in boldface.

employees could opt-out of the plan if they wished to do so. In the *not-enrolled* condition, no wages were set aside unless an employee opted into a plan. For example, the enrolled default read as follows:

Company X has several policies in place for its employees. One of these policies is an “enrolled” default for retirement savings — 5 percent of each employee’s earnings are automatically set aside into a basic savings plan for retirement. Employees who wish to leave the basic savings plan are allowed to do so at any time.

Note that the scenario presents only a single policy default, and makes no reference as to whether the default was actively chosen by policymakers. After reading the policy participants responded to eight statements. These statements, provided in Table 1, assessed a variety of possible explanations for the default option, and were rated on 7-point unmarked scales anchored by the endpoints *Not at all likely* (1) and *Very likely* (7). Half of the statements (items 3–6) assessed explanations that were presumably relevant to making a default decision, such as whether policymakers endorsed the default or chose it based on the majority of employees’ preferences. The other four statements (items 1, 2, 7, and 8) assessed explanations that would be less relevant to making a decision, such as the possibility that policymakers were unsure about their decision or chose the default as a way to

minimize responsibility.

Results and Discussion

Participants were expected to draw choice-relevant information primarily from automatic enrollment defaults, and choice-irrelevant information from non-enrollment defaults. The first task was to establish that responses would cluster on the two dimensions of choice-relevant and choice-irrelevant information, so all items were submitted to a principal components factor analysis (varimax rotation). The rotated solution accounted for all eight items, explained 62% of the variance, and yielded two factors with eigenvalues over 1.0. Table 1 provides factor loadings for all items. The first factor corresponded to choice-relevant information (eigenvalue = 3.12) and accounted for 39% of the variance. The second factor corresponded to choice-irrelevant information (eigenvalue = 1.80) and accounted for 22% of the variance. Indices corresponding to each factor were constructed by averaging across items. The two scales were negatively correlated, but the association was modest ($r = -.21, p = .089$).

As expected, automatic-enrollment conveyed information relevant to making a default decision. Shown in Table 2, participants were more likely to infer choice-relevant reasons under automatic enrollment than under non-enrollment ($M_s = 5.45$ and 3.28), $t(64) = 7.23, p < .001$. Participants were also less likely to infer choice-irrelevant reasons under automatic enrollment than under non-enrollment ($M_s = 2.57$ and

Table 2
Means (standard deviations) for individual items in Study 1

	enrolled	not enrolled	<i>t</i> -statistic	<i>p</i> -value	Cohen's <i>d</i>
<i>Choice-relevant reasons</i>					
item 3	5.09 (1.38)	3.26 (1.78)	4.65	< .001	1.16
item 4	5.91 (1.12)	3.06 (1.79)	7.69	< .001	1.92
item 5	5.91 (0.93)	3.47 (1.80)	6.86	< .001	1.71
item 6	4.88 (1.64)	3.30 (1.72)	3.76	< .001	0.95
combined	5.45 (0.95)	3.28 (1.41)	7.23	< .001	1.82
<i>Choice-irrelevant reasons</i>					
item 1	2.06 (1.31)	2.62 (1.84)	1.38	.172	0.35
item 2	1.94 (1.41)	3.03 (1.90)	2.64	.011	0.66
item 7	4.12 (2.12)	5.12 (1.93)	1.99	.051	0.50
item 8	2.12 (1.31)	3.26 (1.80)	2.93	.005	0.73
combined	2.57 (1.14)	3.51 (1.14)	3.34	.001	0.84

Note: Item 1 is reverse scored.

3.51), $t(64) = 3.34$, $p = .001$. Scores for each of the eight individual items follow the same pattern.

In sum, automatic enrollment was most likely to provide information relevant to making a default decision. Participants viewed automatic enrollment as a reflection of policymaker's beliefs about the optimal course of action — what they thought their employees should do, what was most beneficial for employees, and what most employees would choose for themselves. A non-enrollment default, by contrast, primarily conveyed information not directly relevant to making a default decision. Participants saw it as an indication that policymakers may have been uncertain what to do or did not even decide at all, or was a sign of defensive decision making (the policy that was least likely to get policymakers into trouble). In other words, the information asymmetry reflects the belief that automatic enrollment is a more efficient signal of states of the world relevant to making a default decision. Still, the precise reason why automatic enrollment was viewed differently from non-enrollment was not directly examined. Study 2 addresses this issue.

Study 2

Automatic enrollment is especially informative, we argue, because it alters an individual's state of affairs. In this sense automatic enrollment is a more active or paternalistic policy than non-enrollment. Because people assume that hands-on policies require greater justification than hands-off policies, they take the existence of an automatic enrollment default as evidence of such reasons ("policymakers must have had a good reason for choosing automatic enrollment, otherwise they would not have chosen it"). This account, if correct, should generalize beyond automatic and non-enrollment to

any instance where one policy is more paternalistic than another. Study 2 demonstrates just this: policies varying in degrees of paternalism show a corresponding increase or decrease in judgments of "justifiability."

In discussing approaches to organ donation, Thaler and Sunstein (2008) provide a list of policies that vary in degrees of paternalism. In addition to automatic and non-enrollment, institutions also implement mandated choice and routine removal policies. *Mandated choice* refers to policies where no default option exists and individuals must instead explicitly state their preferences. For example, several U.S. states require citizens to indicate their organ donation status before the application form is processed. Because this policy respects choice — indeed demands it — mandated choice is arguably less paternalistic than either automatic enrollment or non-enrollment. *Routine removal* represents the opposite end of the paternalism spectrum. Under this arrangement, the state owns the bodies of dead individuals, and can remove organs without permission. Routine removal is a special instance of a more general set of policies where policymakers mandate⁵ a course of action. Because individuals are not given a choice in what course of action to pursue, routine

⁵In practice, routine removal policies do allow for opting-out if citizens or family members object, but unlike a presumed consent default (i.e., automatic enrollment) there is no obligation for medical practitioners to notify the next of kin. Since most citizens are unfamiliar with routine removal policies, these policies in effect provide little in the way of individual choice. More abstractly, the crucial difference between automatic enrollment and routine removal policies is whether the rights of a deceased body lay with the state or the individual and their next of kin (for a discussion, see Childress & Liverman, 2006).

removal represents the most paternalistic form of organ donation policy.

If implementing paternalistic policies require stronger reasons and justifications than less paternalistic policies, then we should expect mandated choice to score especially low, and routine removal especially high, on both measures of paternalism and “justifiability”. Both types of defaults are expected to fall somewhere in between, with automatic enrollment scoring higher than non-enrollment. This pattern of findings would suggest a close tie between paternalism and the information signaled by a policy (i.e., its justifiability).

Methods

A sample of 197 adults were recruited from MTurk in a manner similar to the previous study (68% female, average age = 33 years, range: 18–62 years). All participants were asked to make comparative judgments of two different state policies regarding human cornea donation. Cornea donation was chosen because policies vary considerably from state to state (Lee, Stark, & Yang, 1989), and subjects were presumed to have few preconceptions⁶ about them.

All participants first read a description about the general purpose of cornea donations, and were then provided with policies from two different states (generically labeled State A and State B). Each state policy was described in one of four ways: (i) *mandated choice*: citizens were required to explicitly state their preference for cornea donation; (ii) *non-enrollment*: citizens were presumed to be non-donors unless they explicitly opted into donation; (iii) *automatic enrollment*: citizens were presumed to be donors unless they explicitly opted out of donation; (iv) *routine removal*: citizens did not have the choice of whether to become a donor and this decision was instead determined by a medical examiner. Participants were randomly assigned to one of the five possible comparison conditions in which at least one option involved a default: (1) mandated choice vs. non-enrollment, (2) mandated choice vs. automatic enrollment, (3) non-enrollment vs. automatic enrollment, (4) non-enrollment vs. routine removal, or (5) automatic enrollment vs. routine removal.

After reading the two policies participants responded to two blocks of items, representing assessments of paternalism and justifiability, in a counter-balanced order. For the paternalism block participants indicated how “imposing” and “hands off” (reverse scored) the policy was for each state (e.g., “How imposing is State A’s policy?”). For the justifiability block participants indicated the extent that the policy in State A and B were each “in need of a legitimate justification by policymakers,” “in need of a convincing rationale,” and should “require compelling reasons to be implemented.” All items were made on 7-point scales (1 = *not at all*, 7 = *a great deal*), and were combined to form indices of paternalism ($\alpha = .72$) and justifiability ($\alpha = .84$). In addition to counterbalancing order between blocks, items within blocks

were randomized.

Results and Discussion

Results are displayed in Table 3. As expected, mandated choice and non-enrollment policies were viewed as the least paternalistic, followed by automatic enrollment and then routine removal. All comparisons were significantly different from one another at $p < .001$, with the exception of the mandated choice vs. non-enrollment condition, $t < 1$. Importantly, non-enrollment was viewed as considerably less paternalistic than automatic enrollment, $t(41) = 5.37, p < .001$.

A similar pattern was found for assessments of justifiability. Mandated choice and non-enrollment were lowest in justifiability, followed by automatic enrollment and routine removal. Replicating the information asymmetry, the non-enrollment default was viewed as requiring less justification than the automatic enrollment default, $t(41) = 4.46, p < .001$.

Furthermore, paternalism and justifiability were highly correlated. At the participant-level we see a strong positive relationship between paternalism and justifiability, with an average correlation of .63 across conditions (ranging from .41 to .72, all $ps \leq .01$). At the group-level, depicted in the scatterplot in Figure 1, we see a near perfect relationship between the two variables ($r = .96$). In short, a paternalistic policy is a policy in need of justification, and automatic enrollment is viewed as more paternalistic than non-enrollment.

Two other points are noteworthy. First, for both paternalism and justifiability judgments the largest differences are for the two comparison conditions that are the furthest apart on the theoretical continuum (comparisons that are “two rungs” apart instead of “one rung” apart; i.e., rows MC vs. AE and NE vs. RR in Table 3). This finding suggests that participants were sensitive to gradations in paternalism and justifiability across the different comparison conditions, and in a manner consistent with our theoretical expectations.

Second, participants gave roughly equal assessments to the mandated choice and non-enrollment default policies, contrary to expectations. We surmise this is because the two policies are viewed as equally paternalistic (albeit low in paternalism), but in different ways. Non-enrollment makes a presumption of no-action on behalf of individuals who fail to choose, and one could argue that any presumption — even a policy as hands-off as maintaining the current state of affairs — is to some degree intrusive. Mandated choice, on the other hand, is unique in that it makes no presumptions on behalf of individuals, but it does so precisely because it forces

⁶Participants reported their familiarity with cornea transplant policies at the end of the survey (1 = *very unfamiliar*, 7 = *very familiar*). As expected, most participants were unfamiliar with cornea transplant policy: most respondents (86%) reported below the midpoint of the scale, indicating that they were not familiar with such policies. Furthermore, familiarity with cornea transplant policies did not reliably impact any of the results reported below ($ps > .15$).

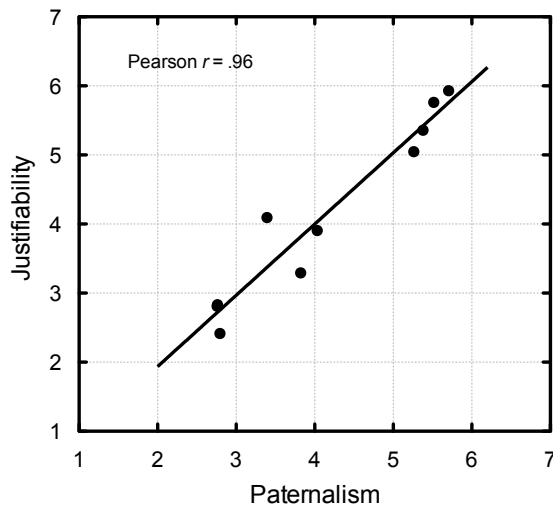
Table 3
Average Paternalism and Justifiability Ratings in Study 2

	Mandated Choice	Non-enrollment	Automatic Enrollment	Routine Removal	Cohen's <i>d</i>
<i>How Paternalistic?</i>					
MC vs. NE	3.82 (1.55)	3.39 (1.87)			-.25
MC vs. AE	2.79 (1.46)		5.38 (1.56)		1.73***
NE vs. AE		2.76 (1.62)	5.26 (1.62)		1.56***
NE vs. RR		2.76 (1.69)		5.71 (1.49)	1.87***
AE vs. RR			4.03 (1.24)	5.52 (1.65)	1.03***
<i>Needs Justification?</i>					
MC vs. NE	3.29 (1.68)	4.10 (1.84)			0.46 [†]
MC vs. AE	2.41 (1.67)		5.36 (1.77)		1.73***
NE vs. AE		2.83 (1.88)	5.05 (1.99)		1.16***
NE vs. RR		2.81 (1.62)		5.93 (1.50)	2.02***
AE vs. RR			3.91 (1.80)	5.76 (1.59)	1.11***

Note: Standard deviations in parenthesis. *** $p < .001$, [†] $p < .10$.

individuals to explicitly indicate their preferences. Choosing to forgo a decision is itself a choice, one that a mandated choice policy does not allow. If anything though, the lack of a strong difference between the two policies simply reinforces the more basic point about the information asymmetry. Even though automatic and non-enrollment were formally equivalent policies, participants viewed non-enrollment as something different — something more akin to a policy requiring citizens to choose for themselves.

Figure 1. Judgments of Paternalism Plotted Against Judgments of Justifiability in Study 2



Study 3

So far we have found that automatic enrollment is more likely than non-enrollment to convey information about a policymaker's reasons. But it is unclear whether this is a direct result of the differences between non-enrollment and automatic enrollment, or because the asymmetry is tracking other characteristics that are associated with (but independent from) default options. For example, automatic enrollment is typically less common than non-enrollment, and often represents a shift from prior policy. While the two constructs are independent of one another — automatic enrollment defaults are not always the result of changes in past policy, and not all changes in policy result in automatic enrollment — they tend to co-occur. Citizens may be focusing on the fact that policymakers had a sufficiently strong reason to change to another policy, and this just happens to occur more for automatic enrollment than for non-enrollment.

Alternatively, defaults may or may not signal implicit advice precisely because of what each policy entails — what they do to people who have not explicitly stated a preference. If people draw information about a policymaker's reasons from the content of the default, then we should expect the information asymmetry to persist regardless of whether the default represents a shift in policy. Study 3 addressed this distinction by experimentally decoupling the default option from policy shift information.

Method

One hundred sixty-six adults at an outdoor shopping mall in Southern California completed a survey in return for candy (43% female, average age = 42.5 years, range: 18–77 years). The study employed a 2×2 between-subjects design, facto-

Table 4
Results from Study 3

	Selected default: auto-enrollment, %		Selected default: non-enrollment, %	
	Stay ($AE_1 \rightarrow AE_2$)	Shift ($NE_1 \rightarrow AE_2$)	Stay ($NE_1 \rightarrow NE_2$)	Shift ($AE_1 \rightarrow NE_2$)
Retirement Savings ($n = 166$)				
<i>Company officials' beliefs about savings plan?</i>				
Suits most employees	45.2	46.3	14.6	20.0
Suits some employees	9.5	14.6	24.4	7.5
Suits few employees	9.5	4.9	4.9	15.0
Default uninformative	35.7	34.2	56.1	57.5
<i>Company officials think employees should be enrolled?</i>				
Yes	59.5	53.6	19.5	25.6
No	16.7	17.1	17.1	18.0
Default uninformative	23.8	29.3	63.4	56.4
Organ Donation ($n = 100$)				
<i>Policymakers' personal decisions about donation?</i>				
Probably donors themselves	54.8	48.4	16.1	12.9
Probably not donors	6.5	6.5	25.8	29.0
Default uninformative	38.7	45.2	58.1	58.1
<i>Policymakers think citizens should be organ donors?</i>				
Yes	67.7	74.2	22.6	29.0
No	9.7	6.5	16.1	19.4
Default uninformative	22.6	19.4	61.3	51.6

Note: Column-wise percentages. Columns may not add up to 100 due to rounding errors. Boldface indicates responses predicted by our reason-based framework.

rially crossing the default option with policy shift information. Participants read about a company considering the default option for its employee retirement savings plan, where the existing default was either automatic enrollment or non-enrollment. They were also told that policymakers, upon reconsidering the existing policy, either decided to switch to the alternative default (*shift* condition) or decided to stay with the original default (*stay* condition). Since staying with the status-quo is sometimes viewed as a non-decision (Kordes-de Vaal, 1996), we used language in both the stay and shift conditions making it clear that policymakers made a conscious, deliberative choice.

Next, participants made inferences about reasons and implicit advice. They were first asked, "What, if anything, do you think choosing this default says about the HR staff's beliefs about how well the retirement savings plan fits employee needs?" The response options were that the savings

plan was probably beneficial for most employees, for some employees, for only a few employees, or that the default was uninformative in this respect. The second question was, "What, if anything, do you think this decision says about the HR staff's views about what they think employees ought to do?" The response options were that the company thought employees ought to be enrolled, ought not be enrolled, or that the default was uninformative.

Results and Discussion

Shown in the top half of Table 4, the information asymmetry was found both when automatic enrollment represented a change and a continuation of past policy. When company officials ultimately chose automatic enrollment, participants in both the stay and shift conditions typically inferred that the company viewed the savings plan as well suited for employees, and thought employees should be enrolled. When the

policy ultimately resulted in non-enrollment, participants in both the stay and shift conditions usually viewed the decision as uninformative. In all cases inferences varied significantly according to the default option (χ^2 's > 7.3, $ps < .05$), but not according to policy-shift information nor the interaction between the two ($ps > .10$).

A follow-up study replicated the results in the domain of organ donation. The methods were similar to before, where we factorially crossed the default option with policy shift information. Subjects responded to a slightly different set of questions, this time asking about the policymakers' personal preferences and their beliefs about whether citizens should be donors. Shown in the bottom half of Table 4, the pattern of findings were similar to that of retirement savings. When the final decision resulted in an automatic presumption of donation, most participants inferred that the policymakers thought citizens should be donors and were probably donors themselves. When the final decision resulted in a "not a donor" default, most participants viewed the default as uninformative. As before, responses varied according to the default option (χ^2 's > 11.3, $ps < .01$), but not according to policy shift information nor between the interaction the two ($ps > .60$). In short, the results from Study 3 suggest that the information asymmetry is independent of policy shift information.

Study 4

The studies so far have focused on default inferences, and have yet to show whether these sorts of inferences impact actual behavior. Study 4 examines the link between default inferences and behavior in a high-stakes, naturalistic decision task.

The study took place in a classroom setting, where university students decided how to schedule three research reports over the course of the quarter. The three reports constituted a significant portion of the student's overall grade in the course (25%), so any decision impacting performance would be consequential. All students had the option of self-imposing "costly" deadlines by committing to a binding deadline schedule to submit papers before the end of the course. The default deadline schedule varied from student to student, and served as the crucial manipulation.

This study takes its design from a previous experiment by Ariely and Wertenbroch (2002). In their study, students either did or did not have the option to impose costly deadlines on themselves. When students were provided with the opportunity to impose deadlines, they usually did so and their grades improved as a result. Compared to those in the control group — where all three reports were due by the last day of class, but could always be turned in early — students who imposed external deadlines on themselves were less likely to procrastinate, and as a result wrote better papers. What makes this finding interesting is that the policy in the control group (i.e., setting all deadlines to the final

day of class) is in some sense the optimal allocation strategy. Ariely and Wertenbroch put it the following way: "By setting their deadlines as late as possible, the students would have the most time to work on the papers, the highest flexibility in arranging their workload, and the opportunity to learn the most about the topic before submitting their papers" (p. 220). But since students often procrastinate, self-imposing costly deadlines ends up improving performance.

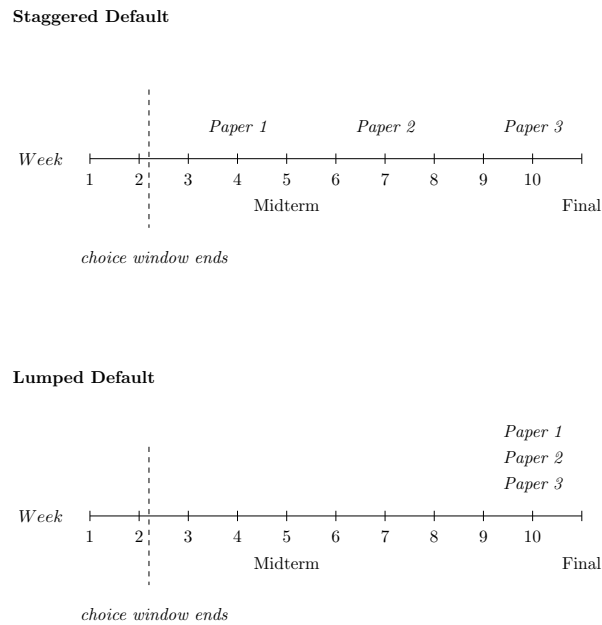
The current study adapts this design by providing all students with the option of imposing costly deadlines, and instead manipulates the default deadline schedule (Ariely and Wertenbroch's subjects were either given no choice at all or required to choose *de novo* without the assistance of a default setting). For half of the students the default was an even allocation schedule, with the deadlines "staggered" throughout the course. For the other half, the default was for all deadlines to be "lumped" together at the end of the course.

Note that this design does not perfectly map onto our distinction between automatic and non-enrollment. Recall that only automatic enrollment alters an individual's state of affairs in the absence of choice. In Study 4 both the staggered and lumped defaults alter the current state of affairs, since students must turn in their papers at some point during the course. However, we reasoned that the basic asymmetry should hold given that the staggered default plays a particularly active role in structuring students' deadlines. To verify this assumption, we conducted a pilot study⁷ asking participants to evaluate the two class policies. The results clearly indicated that students viewed the staggered default as a hands-on policy and the lumped default as a hands-off one. Therefore, the basic information asymmetry was expected to occur — students would be more likely to infer an instructor's reasons and beliefs from the staggered default than from the lumped default — and that this would have a corresponding influence on default behavior.

In study 4 we also examine how feelings of trust in the instructor alters default behavior. Recall from the introduction that our reason-based framework makes a concrete prediction about how trust should impact default behavior, namely it should be particularly pronounced under automatic enrollment. If the staggered deadline default (our proxy for auto-

⁷For the pilot study, a sample of 169 students (drawn from the same student population as that in Study 4) imagined enrolling in a university course and were told that the course required them to write three research papers. Half of students were provided with the staggered default policy, the other half provided with the lumped default policy. All students then indicated agreement on 7-point scales ($-3 = \text{strongly disagree}$, $3 = \text{strongly agree}$) to statements describing the default as "highly structured for students," "highly unstructured for students," "very 'hands on' regarding the deadlines," and "very 'hands off' regarding the deadlines." Responses to the four items were combined ($\alpha = .72$), and as expected students viewed the staggered default as more structured than the lumped default ($M_s = 1.03$ and $-.90$), $t(151.9, \text{unequal variances assumed}) = 10.45, p < .001$.

Figure 2. Overview of Study 4



Note: The figure depicts the default schedule for staggered and lumped conditions. The choice window ended at the end of week 2. In the staggered default, the deadlines for reports 1, 2, and 3 were set for weeks 4, 7, and 10. In the lumped default, the deadlines for reports 1, 2, and 3 were set for weeks 10. For any deadline, students had up until the last day of the week (Sunday at midnight) to electronically submit their report. The midterm exam took place at week 5, and the final exam took place a week after the last day of class.

matic enrollment) is more informative about an instructor's reasons, then the issue of trustworthiness becomes relevant. Distrustful students may have a "schemer schema," viewing signals of implicit advice as not necessarily in their own interests, deciding instead to do the opposite and leave the default (C. L. Brown & Krishna, 2004; Friestad & Wright, 1994). But if participants view the default as relatively uninformative about what the instructor thinks, as we expect for the lumped deadlines default, then there is no need to qualify that (non)information in light of the instructor's intentions. Study 4 tested for this prediction by measuring feelings of trust in the instructor after students had made their default decision.

Methods

The sample consisted of 159 undergraduate students (78% female, average age = 21 years, range: 19–31 years) enrolled in a course on judgment and decision making taught by the first author. Most students were psychology majors, and the rest majored in disciplines primarily within the social sciences. There were 80 seniors, 62 juniors, and 17 sophomores enrolled in the course.

On the first day of class the instructor went over the course syllabus, which included instructions for the study. One re-

quirement involved writing three research reports, each 2–3 pages in length, that comprised 25% of the student's total grade in the course. Students were told that since the subject of the course was decision making, they would have the opportunity to "make some real decisions about how [they] would like the course to be structured" and had the opportunity to arrange any set of due dates for submitting their research reports. Similar in design to Ariely and Wertenbroch (2002), the following constraints were imposed: (i) all papers had to be submitted by the last day of the course, but could always be submitted earlier, (ii) students had to indicate their deadline preferences by the end of the second week, (iii) once the 2-week window closed deadline schedules could no longer be changed or revised, and (iv) deadlines were binding, with late papers penalized roughly 1% of the student's overall course grade per day late. To ensure that there was no incentive for setting early deadlines, students were explicitly told that they would not receive feedback or grades on the reports before the end of the course. Lastly, the assignment prompt for each paper was available online so that complete information about the task was available to students when scheduling their deadlines.

Following the first lecture students were provided with a url link directing them to an online web form for establishing

Table 5
Questions asked in Study 4

<i>Decision Difficulty</i>
1. I found this decision easy. (reverse scored)
2. I found this decision difficult.
3. I found this decision to be confusing.
4. I felt confident in my decision. (reverse scored)
 <i>Default Inferences</i>
1. The instructor probably thinks that students should be enrolled in the default deadline schedule.
2. The instructor probably thinks that most students would achieve a better grade by being in the default deadline schedule.
3. The instructor probably thinks that most students themselves would prefer to be in the default deadline schedule
 <i>Trust</i>
1. In general, I believe that my instructors typically have my best interests in mind
2. In general, I believe that my instructors typically are out to punish their students (reverse scored)
3. When it comes to course policies, I believe that my instructors typically have a solid understanding of how to best structure the course
4. When it comes to course policies, I believe that my instructors typically have no idea what they are doing (reverse scored)

their deadline preferences, and were assigned to one of two conditions (see Figure 2 for an overview). Half of students were assigned to the *staggered deadlines* condition ($n = 87$), where the default was to submit report 1 at the end of week 4, report 2 at the end of week 7, and report 3 at the end of week 10. The other half of students were assigned to the *lumped deadlines* condition ($n = 72$), where the default was for all three reports to be due on the final week of class (week 10). When completing the online form, students first indicated whether they wished to stay with the default or create their own custom schedule, and those who chose the latter were directed to a second webpage to indicate their specific preferences. Other than the default setting, the information provided in both conditions was identical.

After students indicated their preferences online, they were then asked to complete a series of questions ostensibly designed to “provide the instructor with feedback on how to best structure courses in the future.” Students were then presented with items measuring decision difficulty, default inferences, and trust in the policymaker, in that order. For default inferences, the first two items assessed inferences of implicit advice and the last item assessed inferences of majority preference. All items are displayed in Table 5, and were presented as statements to which students indicating agreement/disagreement on 7-point scales ($-3 = \textit{Strongly}$

Disagree, $3 = \textit{Strongly Agree}$).

Students submitted their reports online through a course dropbox, which provided an electronic time-stamp of the submission. At the end of the course, two teaching assistants (blind to the research hypothesis) each graded half of the reports. Also, prior to the final week of the class, students were asked to provide evaluations and feedback for all course policies. Of relevance here were evaluations regarding the deadline scheduling policy. One item assessed evaluations about the policy (“Regarding the research report deadlines, I liked having the option to schedule my deadlines as I wished”) and one item probed for suspicion (“Any other comments, or anything you found curious, about the deadline scheduling?”). Participants responded to the first item on a 5-point scale ($-2 = \textit{Strongly disagree}$, $2 = \textit{Strongly Agree}$) and the second item was open-ended.

Results

All results reported below excluded 14 participants from the analyses. Four students reported suspicion about the deadline scheduling policy, and 10 students completed the deadline scheduling task on multiple occasions and as a result were accidentally exposed to both conditions. Including these participants did not substantively change any of the results reported below.

Evaluations of the Decision Task. Did students prefer having the option of choosing their own schedules? When asked at the end of the course to evaluate the “choose your own deadlines” policy, the majority of students (69%) reported some degree of positive endorsement (by responding above the midpoint). Another 20% were indifferent, and 11% disliked the opportunity to choose their own deadlines. Immediately after their default decisions students were asked about the difficulty of the task, and the majority (72%) did not find the task challenging (responding below the midpoint). Another 8% responded at the midpoint, and the remaining 20% found the task at least somewhat difficult (responding above the midpoint). Overall, students liked the option of setting their own deadlines, and did not find the task difficult or confusing.

Default Decisions. Given that they enjoyed having the ability to choose their own deadlines, and viewed the task as not particularly difficult, did most students make an active choice? Apparently not. The large majority of students stayed with the default option⁸, whether the default called for staggered deadlines (76%) or for lumped deadlines (73%). As a result, the distribution of deadline allocations differed substantially across the two default conditions. Shown in Figure 3, the staggered default distribution shows large spikes at weeks 4, 7, and 10, corresponding to the default schedule. For the lumped default, nearly the entire distribution is set to week 10, again corresponding to the default schedule. Accordingly, students in the lumped deadline had later deadlines than students in the staggered default for reports 1 and 2 (both p s < .001 by a Mann-Whitney U test). Only for report 3, when both defaults assigned a deadline of week 10, was there no marked difference in deadline allocation; if anything, there was a small trend opposite to that of the first two reports ($p = .10$).

Default Inferences. Inferences of implicit advice and majority preference were weakly correlated ($r = .17$), so we analyzed them separately. As expected, students were more likely to infer implicit advice from the staggered default than from the lumped default (M s = 0.28 and $-.52$), $t(142) = 3.51$, $p < .001$. Interestingly, the opposite pattern was observed for majority preference. Students were less likely to infer majority preference from the staggered deadline default than from the lumped deadline default (M s = 0.40 and 0.91), $t(141) = 1.93$, $p = .056$. Although this latter finding was not expected, in hindsight it is unsurprising that students would assume most of their peers to prefer turning in their papers later rather than sooner.

Crucially, inferences of implicit advice were closely tied to making a default decision. Using logistic regression, we find that students who made stronger inferences of implicit advice were also more likely to stay with the default option ($\beta = 0.33$, $SE = 0.14$, $p = .02$). Inferences of majority preference were also positively associated with default behavior,

but not reliably so ($\beta = 0.17$, $SE = 0.12$, $p = .16$). When both implicit advice and majority preference were simultaneously regressed onto default decisions, only implicit advice was a reliable predictor ($\beta = 0.30$, $SE = 0.14$, $p = .04$).

Trust Moderates Default Behavior. A reason-based framework hypothesizes that students would utilize trust information primarily in the staggered deadlines condition, and this was indeed the case. After combining the four trust items to form a single index of trust in the instructor ($\alpha = .72$), we find a reliable trust \times default interaction emerge for default decisions ($\beta_{intx} = 0.59$, $SE = 0.22$, $p = .007$). Examination of the simple slopes indicated that high feelings of trust were positively correlated with default behavior for the staggered default ($\beta = 0.90$, $SE = 0.33$, $p = .006$) but not correlated with default behavior for the lumped default ($\beta = -.29$, $SE = 0.29$, $p = .33$). In other words, feelings of trust mattered more for our automatic enrollment condition than for our non-enrollment condition.

Looking at the complement set of simple slopes is also informative. Among students high in trust (one SD above the mean) we see greater default behavior for the staggered default over the lumped default ($\beta = 0.71$, $SE = 0.31$, $p = .02$). Among students low in trust (one SD below the mean) we see the opposite tendency, finding marginally lower default behavior for the staggered default compared to the lumped default ($\beta = -.48$, $SE = 0.29$, $p = .10$). So high feelings of trust in the instructor meant that students were especially likely to stay with the staggered deadlines default (i.e., the information-rich default), and low feelings of trust had the opposite effect.

A Stickiness Premium for Staggered Deadlines? We explored whether default behavior was especially pronounced in the staggered deadlines condition, analogous to the stickiness premium for automatic enrollment found in previous field studies. Recall that the number of participants staying with the default was roughly the same in both conditions (76% vs. 73%), suggesting that no stickiness premium emerged. However, such a comparison is inappropriate because it does not account for the baseline distribution in students' preferences for each of the deadline options. For example, a difference in default behavior could arise simply because students have stronger ex-ante preferences for turning in papers on weeks 4, 7, and 10 than they do a 10–10–10 deadline schedule. The same logic applies to a null effect, where roughly equal default behavior may be masking a true stickiness premium once the distribution of preferences is taken into account.

One way to address this problem is to use the active choices of students from the opposite condition as an estimate of the baseline preference for that allocation option (see Madrian & Shea, 2001, for a similar technique). To illus-

⁸Eighteen students exhibited strict default behavior and never completed the online survey.

Figure 3. Distribution of deadline allocations by week in Study 5

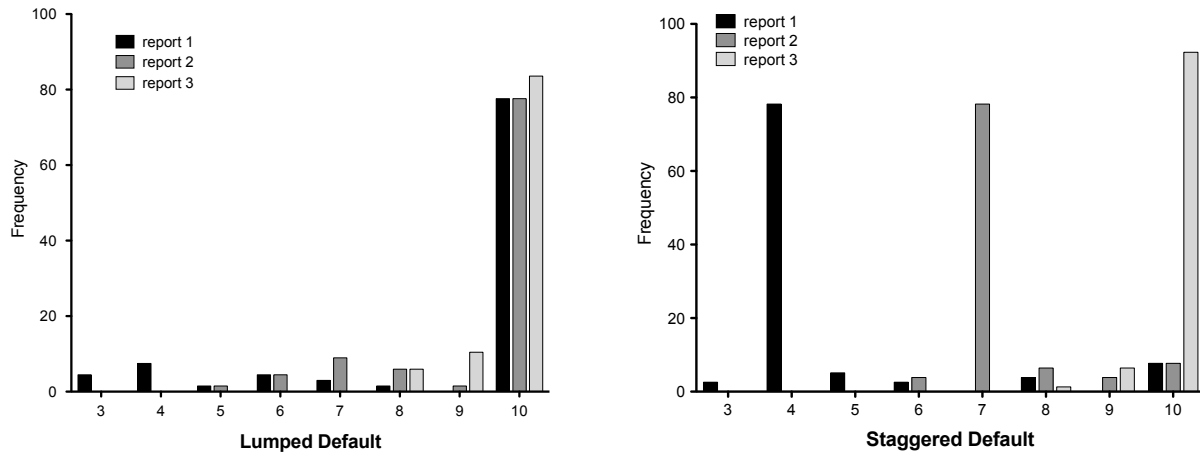


Table 6
Study 5 stickiness estimates (in %)

	lumped default	staggered default
Report 1	70.2	70.5
Report 2	69.9	69.2
Report 3	83.6	92.3
Combined	74.6	77.3

trate, 7.4% of students in the lumped default actively decided to set their deadline for report 1 to week 4 (the designated deadline in the staggered default). Given that students were randomly assigned to conditions, 7.4% can be used as an estimate of the number of students in the staggered default who would have selected that option had it not been the default. Subtracting this number from the Report 1 default rate in the staggered deadlines condition gives us an estimate of the true impact of the default ($78.2\% - 7.4\% = 70.5\%$).

These estimates were calculated for all three reports⁹, and are presented in Table 6. Overall there is a small difference in the expected direction, with slightly higher estimates for the staggered default, but the difference in stickiness rates was never statistically significant (all $ps > .40$). In short, a pronounced stickiness premium did not emerge. However, in the previous section we saw especially high default behavior among high-trust students in the staggered deadlines condition. Perhaps a stickiness premium would emerge given sufficient levels of trust in the instructor.

To examine this, students were partitioned into low-, medium-, and high-trust groups (i.e., a tertiary split). The same procedure as before was then used to calculate stickiness estimates for each of the three groups. Shown in Table 7,

a clear stickiness premium emerged for high-trust students. Among these students, we see on average a 30 point premium for the staggered default over the lumped default, $Z = 2.63$, $p = .009$. No stickiness premium emerged for medium-trust students, and a smaller but marginally significant stickiness premium emerged in the opposite direction (i.e., a 23.6 point premium for the lumped default) for low-trust students, $Z = -1.86$, $p = .063$. In short, the stickiness estimates bear out the same pattern suggested by the simple slope analyses — that genuine default behavior varied as a function of students' trust in the instructor.

Consequences Tied to the Decision. Did the default option have a real impact on student's behavior or on course outcomes? Two measures of performance, course grades and paper submission times (a proxy for procrastination) were used to address this question.

First, the default option did not appear to impact student grades in any meaningful sense. Students in the lumped default earned on average roughly the same grade in the course ($M = 73.92$) as did students in the staggered default ($M = 72.96$), $t < 1$. A similar null result emerged when examining grades only for the research reports or restricting the analysis to only those who stayed with the default option.

One possibility is that the default did not impact grades because students did not in fact procrastinate. Students in the lumped default may have submitted their research reports at roughly the same time intervals as did students in the staggered default. If students were able to allocate equal amounts of time to each paper without the "help" of an external and binding deadline then this would suggest that the

⁹Since the staggered and lumped defaults both set the deadline as week 10 for report 3, baseline preferences should be constant and the regular default rate for each condition was used.

Table 7

Study 5 stickiness estimates (in %) for high-, medium-, and low-trust students

	lumped default	staggered default	Z-statistic
High Trust ($n = 42$)			
Report 1	63.2	95.7	2.67**
Report 2	57.9	95.7	2.97**
Report 3	79.0	100	2.31*
Combined	66.7	97.1	2.63**
Medium Trust ($n = 52$)			
Report 1	57.1	67.8	0.79
Report 2	66.7	67.8	0.08
Report 3	81.0	96.8	1.90 [†]
Combined	68.3	77.4	0.73
Low Trust ($n = 50$)			
Report 1	84.6	50.0	-2.62**
Report 2	76.9	50.0	-1.98*
Report 3	88.5	79.2	-0.90
Combined	83.3	59.7	-1.87 [†]

Note: [†] $p < .10$, * $p < .05$, ** $p < .01$.

default was truly inconsequential. The distribution of submission times, however, suggest that this was emphatically not the case. Shown in Figure 4, there were large spikes in submission times that correspond to the deadlines for each default condition — students submitted their research reports close to the deadline, whatever that deadline happened to be. To test for differences across the two defaults, each submission time was scored by taking its distance from the absolute deadline for all papers in the class (midnight on the end of week 10). For report 1, students in the lumped default turned in their reports on average 26.4 days later than students in the staggered default, and 13 days later for paper 2 (both p s $< .001$ by a Mann-Whitney U test). Only for report 3, when both defaults set the due date for the last day of class, was their roughly equal amounts of procrastination ($p = .75$).

One additional finding is noteworthy. Consistent with the evidence that students in the lumped default procrastinated relatively more, we see a greater number of late submissions in this condition. Of the 20 instances were a late penalty was given, 16 of these were to students in the lumped default ($p = .007$ by a binomial test). Even though the staggered default was a more restrictive schedule, students in this condition were less likely to incur late penalties.

Study 4 Discussion

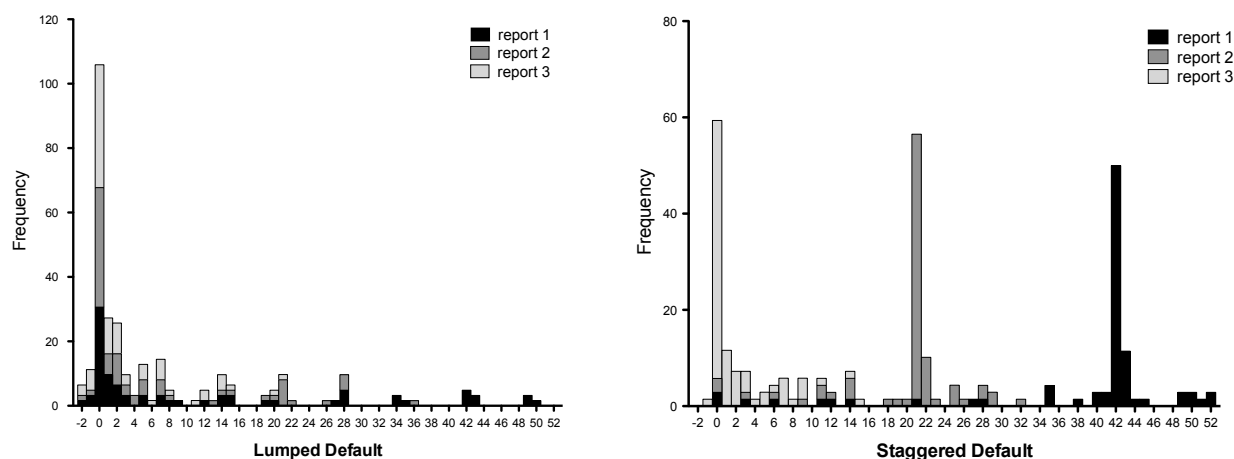
Study 4 yielded a number of interesting findings. First, the large majority of students stayed with the default option,

regardless of whether the default was to “stagger” deadlines throughout the course or “lump” them altogether on the final day of the class. This large default effect also had downstream consequences on students’ behavior, with most students submitting their reports shortly before the closing of the deadline (whatever that deadline happened to be).

Second, the familiar information asymmetry emerged. Students in the staggered deadlines default were especially likely to infer that the instructor thought most students would benefit from staying with the default. Students in the lumped deadlines default, on the other hand, were less likely to draw inferences of implicit advice. Perhaps more important, these inferences predicted whether students chose to stay or leave the default option. The more that students viewed the default as an endorsement by the instructor, the more likely they were to stay with that option.

Third, trust in the instructor moderated default behavior. Under the staggered deadlines default, students high in trust were especially likely to stick with the default, and students low in trust were especially likely to leave the default. Under the lumped deadlines default, trust did not noticeably impact default behavior. This pattern of results mirrors previous findings (Agnew, Szykman, Utkus, & Young, 2008; Liersch & McKenzie, 2011), and is entirely consistent with our reason-based framework. The staggered default was viewed as an implicit recommendation from the instructor, but how that information got used — its impact on choice — de-

Figure 4. Stacked distribution for paper submissions in Study 5



Note: The x-axis represents submission times (in days) from the final day of the course. Negative scores represent papers submitted after the final deadline.

pendent on whether students trusted the instructor. Since the lumped default was relatively uninformative about what the instructor thought, there was no need for students to qualify that (non)information in light of the instructor's intentions.

Overall, Study 4 suggests that default inferences can play an important role in determining default behavior. This study provides the first experimental evidence that such inferences directly influence choices with consequential outcomes. The "stickiness premium" for automatic enrollment 401(k) plans often found in field studies (Agnew & Szykman, 2005; Choi et al., 2004; Madrian & Shea, 2001) suggests that inferences of implicit advice can play an important role in consequential decisions, but these studies never directly measures or tested for such inferences. While one previous experiment (McKenzie et al., 2006) demonstrated a direct causal role between default inferences and real choices, the decision task was relatively low-stakes (participants chose to read one of two single-page reports).

Study 4 is also noteworthy because many of the elements that should, from a rational actor standpoint, eliminate default effects were in fact present. Transaction costs were minimal, since students could easily leave the default by completing a short survey at their convenience. Students were experienced in the task domain and surely have made time allocation decisions for papers from previous courses (all students in the class were at least Sophomores). Students were presumably motivated to decide well, and did not report finding the task overly burdensome or difficult. All of these elements have been proposed as factors that should reduce decision biases (Shafir & LeBoeuf, 2002), yet we still

observed a large default effect. A different view is that consequential decisions do not necessarily transform people into economically rational agents, but instead drives them to rely all the more heavily on the cognitive tools at their disposal (e.g., Arkes, Dawes, & Christensen, 1986). Here, one of those tools appears to be the inferences that students draw about the instructor's reasons and beliefs in setting the default option.

General Discussion

The current paper proposes a reason-based framework for understanding default effects. When confronted with an automatic enrollment default, individuals often infer that policymakers "must have had a good reason" for choosing that policy, thereby signaling implicit advice. These signals lead people to stay with the default, especially when individuals trust the policymaker and are uncertain how to best decide. When confronted with a non-enrollment default, on the other hand, individuals are less likely to infer that the default was chosen for a relevant reason. Instead, non-enrollment defaults are usually viewed as uninformative about what policymakers' think.

An information asymmetry arises because automatic enrollment, unlike non-enrollment, alters an individual's state of affairs in the absence of choice. Given that people have a bias towards inaction, status-quo altering policies are presumed to require more compelling justification than status-quo maintaining policies. From this presumption people draw a related inference that aids in making a default decision ("given that the default is automatic enrollment, what

is the probability that ‘good reasons’ exist?”).

More generally, a reason-based framework suggests that people interpret and explain public policies by relying on the same basic cognitive tools that they use to explain everyday social behavior (Malle, 2004). Just as people appeal to an agent’s subjective reasons for acting in explaining their behavior, so too do they appeal to a policymaker’s reasons to explain the existence of a policy. That default effects are partly social-psychological in nature has a number of interesting policy, managerial, and organizational implications. The following sections represent a partial list.

Implications for Libertarian Paternalism

A reason-based account complicates the arguments for libertarian paternalism. Libertarian paternalists argue that managers and policymakers should create policies that nudge behavior in welfare-enhancing directions as long as they do not meaningfully obstruct individual choice (Camerer, Issacharoff, Loewenstein, O’Donoghue, & Rabin, 2003; Thaler & Sunstein, 2003). Since defaults have a large influence on behavior, and do not alter the choice set, they are often presented as prime examples of sound libertarian paternalistic policies (Thaler & Sunstein, 2008). Advocates of libertarian paternalism defend their prescriptions by appealing to two basic premises. First, all policies impact choice; this is an inescapable consequence of the fact that preferences are highly constructed and sensitive to context. The second point follows from the first; since all policies impact choice, policy should influence behavior in ways that enhance welfare given the reality of human shortcomings (Thaler & Sunstein, 2003).

The current findings do not necessarily refute either of these claims, but do qualify them. On the first point, the degree to which defaults impact choice will depend partly on the information they provide. Since automatic enrollment defaults send especially strong signals of implicit advice, they actively influence default decisions in a way that non-enrollment defaults usually do not. But for the same reason, automatic enrollment is also potentially less paternalistic than non-enrollment. Automatic enrollment may play a more active role in shaping default decisions, but it is a participatory role — a suggestion that individuals either accept or reject. To the extent that non-enrollment defaults influence behavior through means other than rational persuasion (e.g., through inattention), using them to shape behavior is arguably more paternalistic (Hausman & Welch, 2010).

Furthermore, whenever defaults such as automatic enrollment convey information about what people ought to choose or what most people do choose, they have the potential to stigmatize non-default behavior (Glaeser, 2006). For example, some subjects are reluctant to opt-out of routine testing for sexual transmitted infections because doing so implies that one has “something to hide” (Young et al., 2009).

That defaults can stigmatize behavior would certainly place a meaningful burden on those who wish to leave the default, and would be contrary to tenets of libertarian paternalism. A reason-based framework can therefore help managers and policymakers to understand and design defaults that do not inadvertently stigmatize¹⁰ non-default choices.

On the second point concerning human limitations, the current studies suggest that default effects are not just a consequence of these limitations, but also a product of active attempts to overcome them — individuals recognize they have incomplete information and are unsure how to best decide, and cope with this partly by using the policymakers’ choice of default as a guide. This fact does not threaten the case for libertarian paternalism, but does suggest that policymakers should be cautious in concluding that a bias toward staying with the default is simply the result of people acting irrationally.

Potential Downsides of Automatic Enrollment

A related point is that actively setting defaults can sometimes do more harm than good. Consider, for example, that automatic enrollment into a retirement savings plan substantially increases the number of employees who save for retirement. While virtually everyone would agree this is a positive outcome, the default allocation may often be too conservative. Recent surveys of companies using automatic enrollment savings plans find that many companies arguably set savings rates that are too low and use investment vehicles that are too conservative (Choi et al., 2004). Because automatic enrollment is especially sticky, this means that some employees who stay with the default might have eventually ended up choosing a more aggressive savings plan on their own. Ironically, over the long run employees may accumulate *less* wealth under an automatic enrollment default (for a discussion, see Choi et al., 2004).

More generally, there is also the possibility that defaults can undermine intrinsic motivation and increase feelings of regret. Passively accepting the default option leads to weaker identification with the accepted course of action (Cioffi & Garner, 1996) and inaction often leads to increased feelings of regret over the long run (Gilovich & Medvec, 1995). Indeed, university employees in Illinois who stayed with the default pension plan were more likely to report regret later on than employees who actively chose a different plan (J. R. Brown et al., 2011). This was the case even when controlling for outcomes: employees who failed to indicate a preference, and were therefore placed into the default savings

¹⁰Of course, policymakers may actually wish to stigmatize certain behaviors (such as forgoing testing for STIs), and a reason-based framework can also help in designing policies with this goal in mind. But policies that do so are inconsistent with libertarian paternalism, and are more in line with traditional paternalistic approaches.

plan, were more likely to report regret than employees who explicitly indicated a preference for the default option (35% vs. 14%). However, all employees in this study had the same default savings plan, so it is unclear if feelings of regret are associated with specific default options or are simply a result of passive default behavior.

Both of these issues highlight the difficulties in setting defaults in ways that enhance welfare. One recommendation commonly put forth is to educate individuals about the decision task, such as increasing financial literacy for retirement savings. Default behavior has been tied to a lack of knowledge about the decision task (Agnew & Szykman, 2005; Agnew et al., 2008), so educational outreach programs should help to eliminate some of these problems (but see Hadar, Sood, & Fox, 2011, for limitations to this approach). Interestingly, one study also found a positive correlation between inferring implicit advice from the default option and feeling incompetent in the task domain (J. R. Brown et al., 2011), suggesting that education programs may also reduce reliance of any implicit suggestions provided by the default. Other approaches include simplifying the decision task (Beshears, Choi, Laibson, & Madrian, 2010b), mandating choice instead of having a default (Carroll, Choi, Laibson, Madrian, & Metrick, 2009), and creating defaults that adapt and learn from each individual's preferences ("smart defaults"; Goldstein, Johnson, Herrmann, & Heitmann, 2008). Managers and policymakers can supplement these approaches by identifying the preconditions that determine when defaults will be optimal or suboptimal (Beshears, Choi, Laibson, & Madrian, 2010a; Carroll et al., 2009).

Concluding Remarks

Default effects are significant and pervasive, and it is tempting to conclude that such behavior occurs because people procrastinate, waffle, or fail to decide. This paper illustrates that default behavior can also result from active thinking. Individuals make a fairly sophisticated set of inferences about a policymaker's beliefs and reasons, and use this information to cut through the uncertainty and complexity that often accompanies default decisions. As a result, default effects can play out in interesting and dynamic ways.

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