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# Estimating the impact of information search, attitudes, and consumer characteristics on use of GE labels in a mandatory GE labeling policy environment

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The debate surrounding the labeling of GE foods (genetically engineered) in the U.S.

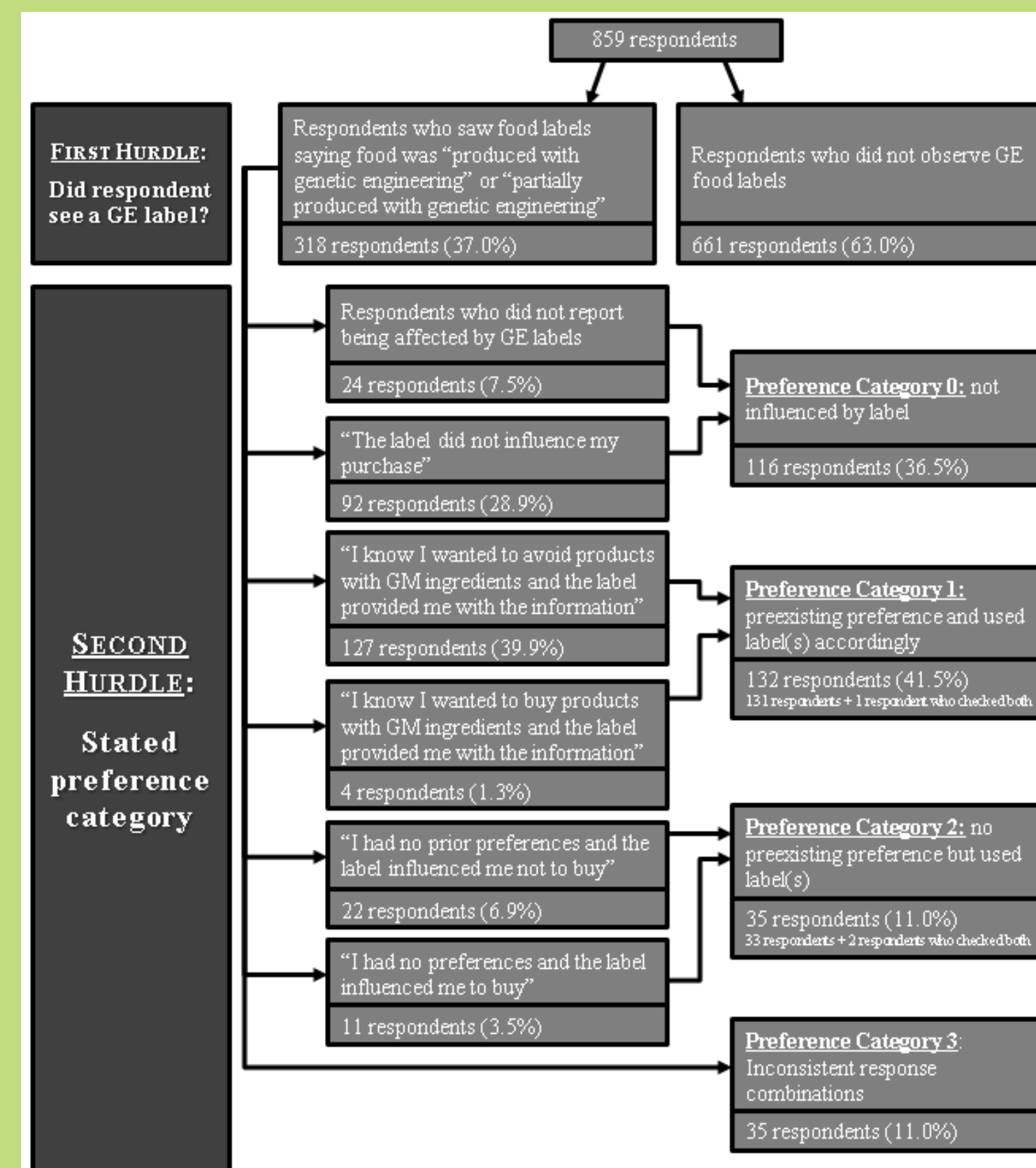


is contentious. Using survey results from Vermont where a mandatory GE labeling policy was briefly in effect in 2016, we estimate a multinomial logistic model with selection to identify the effects of a number of factors on the likelihood of not using a label for decision making, using the label to reveal preferences, using the label to influence preferences, or not being consistent in label use.

Vermont was the first U.S. state to enact a law mandating that all foods containing GM ingredients be labeled. This measure was superseded by federal legislation less than one month after it was implemented in June 2016. Data were collected via a telephone survey of 1034 Vermont residents in November 2016 and February 2017. This is the first survey of its kind in America about consumer decision making in a mandatory GE labeling policy environment.

## Methods

A “double hurdle” model was used. First, a binomial probit estimated the probability of seeing a GE label. Second, a multinomial logit model estimated the marginal effects on the included variables at data means on the



probabilities of identifying oneself as a member of one of the four categories shown above. Given a respondent saw the GE label (37.0%) the model estimated a .38 prob. of not using the label, a .37 prob. of using label information to reveal preexisting preferences, a .12 probability of the label influencing preferences and choice, and a .14 probability of inconsistent responses dependent on product.

## Results

Significant predictors of seeing a label included income, age, active information seeking about GE and passive information seeking about GE (paying attention to GE information “if it catches my eye”). Respondents who reported general label reading usage of front of package information were less likely to have seen a GE label. Those who reported using “natural” labels were more likely to have seen the GE label. In the multinomial logit, estimates of the marginal effects showed that support for and opposition to GE were both significant predictors of the likelihood of not using the GE label in choice decisions. Respondents who engaged in active or passive search for GE information in general were more likely to have pre-existing preferences and used the label to reveal those preferences. Respondents who opposed the use of GE in food production were less likely to have the label create their preference for GE products. No predictors were significant for consumers who saw labels, but could not identify one single way they used or did not use them when making a choice.

Variable	Variable Description	Did Not See a GE Label	Marginal Effects of Estimates			
			Were not influenced by label (PrefCat=0)	Had a preexisting preference and used label accordingly (PrefCat=1)	No preexisting preference but were influenced by label (PrefCat=2)	Inconsistent Response Combinations (PrefCat=3)
TIME	Spring Data Collection Dummy	0.01084 (0.03243)	-0.14649* (0.07834)	0.07793 (0.07793)	-0.01126 (0.04896)	0.07983 (0.05322)
DS0KPLU	Income \$50,000 or Greater	0.07768** (0.03489)	0.11262 (0.09464)	0.00085 (0.08500)	-0.03234 (0.05133)	-0.08114 (0.05482)
DEFGMOCR	Defined "GMO" Correctly	0.04332 (0.03385)	-0.01042 (0.08015)	0.04966 (0.08141)	-0.03312 (0.05257)	-0.00612 (0.05564)
GENFEM	Female	0.00021 (0.00020)	-0.14960* (0.07915)	0.11312 (0.07592)	0.01706 (0.04874)	0.01942 (0.05394)
BACHPLUS	Bachelor's/Professional Degree Dummy	0.03347 (0.03426)	-0.01376 (0.08094)	-0.02571 (0.08294)	0.06412 (0.05213)	-0.02466 (0.05735)
FAMWCH	Family With Children Dummy	-0.02642 (0.03581)	-0.00437 (0.08740)	0.08386 (0.08471)	-0.03685 (0.04724)	-0.04265 (0.05077)
AGE	Age	-0.00317*** (0.00100)	0.00100 (0.00250)	0.00359 (0.00256)	-0.00226 (0.00148)	-0.00232 (0.00155)
OPPGMOS	Somewhat or Strongly Oppose GMO	-0.02294 (0.04569)	-0.31516*** (0.10333)	0.46249*** (0.11562)	-0.10648** (0.05378)	-0.04085 (0.06383)
GMOSUP	Support or Strongly Support GMO	0.04461 (0.05136)	0.27755** (0.12674)	-0.18543 (0.16124)	-0.12181* (0.07082)	0.02968 (0.07811)
SEEKINFO	"I seek information about GMOs" Dummy	0.20491*** (0.05310)	-0.34593*** (0.11417)	0.30743** (0.12917)	0.00078 (0.07800)	0.03771 (0.08570)
CATCHEYE	"I pay attention [to information on GMOs] if it catches my eye" Dummy	0.11719*** (0.04262)	-0.40878*** (0.10901)	0.29091** (0.12485)	0.08425 (0.07801)	0.03361 (0.08002)
LFRTNPKG	Consults product information on front of packaging (low fat, reduced calorie, etc)	-0.10597*** (0.03497)				
LINGRDNT	Consults ingredient list	0.05968 (0.04927)				
LNUTRINF	Consults nutrition information	0.00040 (0.04944)				
LORGANIC	Notices labeling indicating food is organic	0.03443 (0.04019)				
LNATURAL	Notices labeling indicating food is "natural"	0.06723* (0.03651)				

Note: N= 859 respondents. Standard errors in parentheses. \*\*\*, \*\*, \* indicates significance at the 1%, 5% and 10% level.

## Conclusions

Results indicate that more respondents who saw a label reported they had preexisting preferences and the label helped them to make a choice that revealed those preferences (Prefcat1), or they did not use the label to make a choice (Prefcat0). Only respondents with neutral attitudes toward the use of GE in food production were more likely to have a label influence their preferences and choice for GE products (Prefcat2). For more than 2/5 of respondents, the label revealed pre-existing preferences. For more than 1/3, the label did not impact purchase decisions. For just over 10% of respondents, the label helped form preferences, with 2/3 of these choosing to avoid GE products and 1/3 choosing to purchase them. Lack of significant results for respondents who did not use labels in a consistent manner indicates wide variability in consumer characteristics. Overall, respondents' behavioral reports in a mandatory labeling setting, show that for more than 92% of respondents who saw the label and 2% of all respondents, GE labels did not influence preferences in a way that led to avoidance of GE purchase decisions.

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