

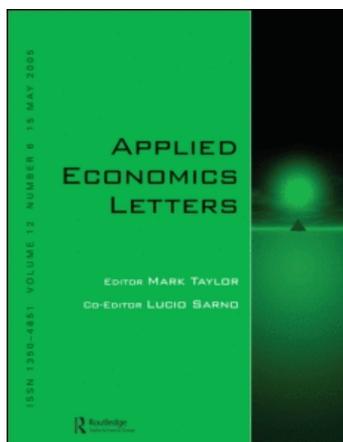
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Clifford A. Lipscomb^a; Brandon C. Koford^a

^a Valdosta State University, 1500 N. Patterson Street, Valdosta, GA, USA

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Conservative dichotomous choice responses in the active policy setting: the case of University Parking

Clifford A. Lipscomb* and Brandon C. Koford

Valdosta State University, 1500 N. Patterson Street, Valdosta, GA 31698-0075, USA

This study presents evidence of strategic behaviour in faculty/staff members' reports of willingness-to-pay at a public university. The results suggest that (1) students have a higher mean willingness-to-pay than faculty/staff and that (2) faculty/staff reject clear gains because they expect a revision to the parking permit fee structure in the future.

I. Introduction

People face incentives to answer contingent valuation questions differently in the active policy setting. The contingent valuation literature suggests that when survey respondents are asked about an issue with some immediacy, they might willingly reject known gains hopefully to induce a future revision of the policy that benefits them later on. Farmer and Lipscomb (2008) show that fleet managers in metropolitan Atlanta strategically reject bids below the current price of \$25 to obtain a vehicle emission permit in anticipation that the Georgia General Assembly may revise the policy (i.e., making it less expensive to obtain the emission permits).

In this article, we suggest that similar strategic behaviour exists in faculty/staff members at a regional university in the southern United States. The active policy environment is the impending construction of two parking garages that will alleviate campus-parking space limitations. If one of these groups (students or faculty/staff) exhibits strategic behaviour, then we might expect to see in the data that one group is rejecting a larger proportion of clear gains (bids below the current price of the yearly parking permit) and has relatively lower estimates of

Willingness-to-Pay (WTP) for the permit. Evidence suggests that faculty/staff members act strategically by rejecting known gains of lower permit prices in anticipation that parking policy may be revisited in the future. Furthermore, our research suggests that faculty/staff members have an estimated mean WTP of \$64 (with a 95% confidence interval of \$50–78), whereas students have a mean WTP of \$86 (with a 95% confidence interval of \$67–105). The results also suggest that students have a higher time cost in seeking out a parking spot on campus.

II. Policy Environment

The policy environment for this study revolves around a university's provision of parking spaces for students as well as for the faculty/staff members. With no public bus system in the city, the only options for accessing the university are private vehicle, bike or walking. The 'market' in this case is governed by the university's Parking and Transportation Office, which sets a uniform price for parking permits based on whether a person is a student (\$50) or faculty/staff member (\$60). This policy setting is *active* because at the time of survey administration (Fall Semester 2006), university

*Corresponding author. E-mail: calipscomb@valdosta.edu

community members did not know the specific parking alleviation policies that were to be implemented beginning in December 2007. Rumours circulated about new parking garages and more frequent intracampus bus service. Students and faculty/staff are knowledgeable respondents who recognize that permit fees may change in the future. Because faculty/staff and students have faced the same prices over the past few years, we expect *a priori* for them to accept bids more often at prices below the current prices.

III. Data and Methods

Data for this study are from a survey administered to the faculty/staff and students at a Southern regional university before the implementation of parking congestion alleviation strategies on campus. Potential student respondents were approached on campus and asked to complete the survey; faculty/staff had a copy of the survey placed in their campus mailboxes. Copies of the surveys are available upon request from the authors.

To test for strategic behaviour, we estimate WTP using a logistic regression model. We use the (0,1) variable ACCEPT as the dependent variable, where a respondent's acceptance of the bid price offered is recorded as ACCEPT = 1, and 0 if the bid price is rejected. ACCEPT is regressed against the following covariates: BID, FAC/STAFF, MINSAV and MALE. BID is the random bid value offered to each respondent in the survey (see Table 1 for the range of bid values offered to each group); different bid values were presented to different respondents randomly so that the value of parking could be estimated. FAC/STAFF indicates whether the respondent is a student (FAC/STAFF = 0) or a faculty/staff member (FAC/STAFF = 1). MINSAV is the estimated number of

minutes a respondent would save by having guaranteed access to a parking space when needed. Finally, MALE indicates whether the respondent is male (MALE = 1) or female (MALE = 0).

Following Johansson (1995, p. 113), mean WTP for a parking permit is estimated using the formula

$$-\frac{1}{\beta}[\ln(1 + e^{\alpha})]$$

where β is the BID coefficient from the logistic regression equation and α is the constant in the logistic regression equation (which includes the effects of all other covariates added to the constant). This formula restricts WTP to be non-negative, which is appropriate for a private good such as a parking permit (Blumenschein *et al.*, 2008).

IV. Results

From Table 1, we see a surprising result: faculty/staff members *rejected* bid prices lower than the current permit price at higher rates than students. In fact, compared to the generally orderly decline in acceptance rates across the bid spectrum for students, acceptance rates for faculty/staff members vary widely.

Some might argue that the bid acceptance pattern could be explained by faculty/staff confusing the bid as a charge in addition to the current parking fee. If they were confused in this manner, then we would expect to see acceptance rates spike at prices slightly above the current \$60 price for the permit. Table 1 suggests that no such spike exists in the data, which suggests that faculty/staff were not confused by the survey. Also, it is possible that faculty/staff viewed the permit fees as changing in the future, suggesting that

Table 1. Acceptance rates of bid prices – faculty/staff

Bid price (\$)	Acceptance rate in % (<i>n</i>)	Bid price (\$)	Acceptance rate in % (<i>n</i>)
Faculty/staff			
40	43 (9)	70	80 (10)
45	83 (12)	85	47 (17)
50	100 (11)	100	31 (13)
55	70 (10)	120	31 (13)
60 (<i>current price</i>)	67 (6)	150	21 (14)
65	8 (16)		
Students			
30	95 (19)	60	89 (19)
35	100 (20)	75	65 (17)
40	94 (18)	90	72 (18)
45	94 (18)	100	79 (19)
50 (<i>current price</i>)	95 (19)	120	44 (16)
55	100 (18)	\$150	38 (13)

the rejection rates at lower bid prices may be due to the idea (1) that bids less than \$60 were not credible, (2) that faculty/staff members were hoping that permit fees would be revised downward due to their responses or (3) that faculty/staff members anticipated a higher permit fee to pay for any parking-related construction activities. Follow-up discussions with a random group of faculty/staff respondents support their view that permit fees may be revised downward.

For students, it is possible that they have higher acceptance rates where there are clear gains (bids below \$50 in Table 1) because they realize that they must spend more time searching for parking spaces compared with the faculty/staff. This idea, along with other differences between students and faculty/staff, is reported in the descriptive statistics in Table 2. The idea that students' time cost of searching for parking may be relatively higher, coupled with the clearly higher acceptance rates at the upper end of the bid range (\$90 and higher), suggests that factors other than income are responsible for the differences in WTP between students and faculty/staff members.

In addition to different time savings to locate a parking space, Table 2 suggests that (1) a larger percentage of students arrive and leave campus more than once during a typical day and (2) a larger percentage of students fail to find a parking space within 3 minutes of arriving to campus.

Next, logistic regression estimates are reported in Table 3. We find, as expected, that a significant negative relationship exists between bid acceptance and the bid price, that faculty/staff members have a significantly lower probability of accepting a bid offer, that additional minutes saved increases the probability of bid acceptance and that male respondents have a lower probability of bid acceptance. Of particular interest are the marginal effects at the mean of each independent variable, which are also reported in Table 3. We see that a one-dollar increase in the bid price decreases the probability of bid acceptance by 0.005, a one percentage point increase in faculty

Table 2. Descriptive statistics

	Faculty/staff	Students
Number of observations	131	214
Percent that arrive and leave campus more than once	28	56
Percent that failed to locate space within 3 minutes	12	41
Average minutes a guaranteed space would save	10.4	21.4
Average age in years	44.2	21.1
Percent male	52	44

Table 3. Logistic regression results

Variable	Coefficient (SE)	Marginal effects (SE)
BID	-0.0338*** (0.0047)	-0.0053*** (0.0008)
FAC/STAFF	-0.7443** (0.3110)	-0.1237** (0.0541)
MINSAVE	0.0624*** (0.0147)	0.0098*** (0.0022)
MALE	-0.5503* (0.2995)	-0.0876* (0.0478)
CONSTANT	3.3294*** (0.5298)	-

Notes: $N = 345$; McFadden pseudo- $R^2 = 0.295$.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

decreases the probability of bid acceptance by 0.124, an additional minute saved increases the probability of bid acceptance by 0.010 and being male decreases the probability of bid acceptance by 0.088, *ceteris paribus*. Finally, we use a difference of means test ($H_0: WTP_{STUDENTS} - WTP_{FACULTY} = 0$) to confirm that the mean WTP for faculty/staff (\$64) is statistically different from the mean WTP for students (\$86). This is indeed the case [$\chi^2(1) = 6.02$, prob = 0.014].

V. Limitations and Conclusions

One limitation is that the test for the active policy setting (Farmer and Lipscomb, 2008) may contain too few test points; we test for differences in proportions of 'yes' votes between faculty/staff and students below the listed price for parking permits. The bid prices common on both the student and the faculty/staff surveys are \$40 and \$45, respectively. The difference of proportions test shows significantly different acceptance rates at the \$40 level (z -statistic = 2.45), but not at the \$45 level (z -statistic = 1.01). So, there is some evidence that the active policy setting at the university accounts for part of the difference in acceptance rates among students and faculty/staff.

In addition, we expect faculty/staff members to have higher incomes than students, with possibly few exceptions. With higher incomes, we might expect the faculty/staff members to have a higher percentage of 'yes' votes at higher bid values than students. Or we might expect faculty/staff members to have a higher WTP for a parking permit. We find, however, that students say 'yes' more often to the higher bid amounts (\$90 and higher). At the \$100 bid price, the percentage of 'yes' votes is statistically greater for students (z -statistic = 2.51). At the \$120 and \$150 bid values, the students have a higher percentage of 'yes' votes, but the difference is not statistically significant ($z = 0.86$ and 0.83 , respectively). So, given that students have a higher mean WTP for a parking permit compared to faculty/staff and that income is

higher generally for faculty/staff members, the presence of an income effect is unlikely.

One other possibility driving the results is the different incomes earned by College of Business Administration (COBA) faculty compared to the faculties of other colleges at the university. After using the same logistic regression specification plus an interaction term (FAC/STAFF*COBA) to indicate whether the faculty/staff respondent was employed by the COBA, the results suggest that COBA faculty/staff have a higher but not statistically significant estimated mean WTP (\$78) compared to all the faculty respondents (\$64).

Therefore, we conclude that the presence of an active policy setting is responsible for the strategic behaviour exhibited by faculty/staff members in this sample. Evidence suggests the absence of an income

effect but the presence of a higher time cost for students, which translates into a significantly higher mean WTP for student parking permits at the university.

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