

Pricing Police Dogs: Contingent Valuation of Service Dogs



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Campus Crime

- The university campus was once viewed as a haven from the violence and criminal activity of the outside world.
- The growing threat of crime has placed increasing responsibilities on campus law enforcement agencies.
- Violent crime, illegal drug use and the threat of civil litigation against the institution are all very real issues facing college administrators (Wolf, 2001).

Scope of the Problem

- 95% of all campus crime involved drugs or alcohol (Sloan, 1994).
- Relationship between drugs and weapons on campus (Fernandez, McBride, and Lizotte, 1997).
- 19 % of the UCF student's surveyed admitted marijuana use within the last month (Mesloh, Pate, and Henych, 2003).
- That is 7,410 drug users!

The Nexus

- Research has documented a nexus between **crime** and **drugs** and the literature does suggest that a reduction in drug use would have a marked effect on the crime rate.



Reduction in Crimes

- “The anticipated long-term results, then, would be a drop-off in arrests, as more and more students and other campus visitors decided that they should not bring their drugs or other criminal activity to a facility that is adept at locating it “(Mesloh & Wolf, 2001).



UCF Police Department K-9's



Buddy-explosives



Rommel-public relations

And the newest addition...



Bailey-narcotics detection

Higher Education Canine Programs (2001)

Institution	Narcotic	Explosive	Track	Handler Protection
Ball State	Yes	No	Yes	Yes
Northern Arizona	No	Yes	No	No
Michigan State	Yes	Yes	Yes	Yes
University of Arizona	Yes	No	Yes	Yes
Central Michigan University	Yes	No	Yes	No
University of Illinois	Yes	No	Yes	Yes
Central Missouri State	Yes	No	Yes	Yes

(Mesloh & Wolf, 2003)

Recent additions to the canine community

- University of Florida
- University of Central Florida
- University of Massachusetts Amherst
- University of Toledo
- University of Texas at Austin
- University of Albany

UCF Police Department K9 Functions

- Tracking
- On-lead area search
- Article search
- Narcotics detection
- Explosives detection
- Public relations events
- ***No aggressive functions***

Cost Effectiveness Factors

- Crime Prevention and detection
- Increased Visibility and perception of the University
- Overall Effectiveness
- Reduction in fear

The question is...how do you measure these things?

UCF Police Department Student Survey



- 598 undergraduate students
- Sample was taken from a mixture of different general education courses
- Public opinion
- Perceptions towards police dogs
- Correlations between police dogs and drug and/or crime reduction

Highlights of Survey

- Deter Drug Use 70%
- Reduce Crime 67%
- More Secure (bomb) 60%
- Prior Contact 83%
- Waste of \$\$\$ 12%
- Ability to Track down 84%

Demographics

	%	N
Gender (n = 595)		
Male	42.6	255
Female	57.1	340
College Status (n = 593)		
Freshman	29.5	175
Sophomore	27.0	160
Junior	23.8	141
Senior	19.7	117
Race (n = 589)		
White	69.2	414
Black	12.4	74
Hispanic	7.9	47
Asian / Pacific Islander	4.3	26
Indian / Alaskan Native	.3	2
Other	4.3	26
Residence (n = 596)		
On campus	41.8	250
Off Campus	57.9	346

Canine Study

- “Perceptions of the Effectiveness of Canine Units on University Campuses” (Mesloh & Henych, 2004).
- Three models or perceptions of police dogs
- Some social constructed variables valid across the three model.

Correlations Between Measures

<u>Variables</u>	<u>Crime Reduction</u>	<u>Deter drugs</u>	<u>Waste of \$\$\$</u>
Crime Reduction	1.000		
Deter Drugs	.625**	1.000	
Waste of \$\$	-.465**	-.546**	1.000

Note. **p < .01. (two tailed)

OLS Regression of Student Perceptions of Police Canine Within Three Constructs of Effectiveness

	<u>Crime Reduction</u>	<u>Drug Reduction</u>	<u>Waste of \$</u>
Marijuana use	.064	.185***	-.204***
Cocaine use	.027	.021	.007
Perceived ability	.390***	.260***	-.279***
Legal knowledge	.127**	.141**	-.102**
Media construction	.151***	.147***	-.030
Fear of dogs	-.046	-.071	.069
Gender	-.042	-.032	.080
Fear index	.116*	.077	.020
Police index	.138**	.163***	-.134**
White	.104	.084	-.026
Black	.079	.128*	-.028
Hispanic	.108	.079	-.023
F	13.17***	12.15***	9.61***
R	.569	.554	.509
R²	.324	.306	.259
Adjusted R²	.299	.281	.232

What does this mean?

- Three measures of police dog effectiveness are correlated and measure similar if not identical constructs
- However, there is one measure that can be translated across disciplines



Contingent Valuation

- CV able to elicit benefits where other methods are not (Mitchell & Carson, 1989).
- Creates a hypothetical market to determine respondent's stated preference for a public good (Oglethorpe & Miliadeau, 2000).
- Respondents are asked to express what they would be willing to pay or what they would be willing to accept for specified changes (Mitchell & Carson, 1989; Hanley & Knight, 1992).

Prior Uses of CV

- Environmental and Natural Resource
- Healthcare and Medicine
- Value of Life and Safety
- Energy and Fuel
- Domestic Violence and Public Policy
- Over 1600 CV studies (Carson et al., 1994)

Willingness to Pay Survey

- Hypothetical Scenario with open response
- Asked how much they were willing to pay for specific services and that no actual assessment would occur.
- Not using a referendum format, which utilizes subsets with a yes /no choice concerning a specific price (Green, 1992) that tends to give upwardly biased estimates of value (Green, Kahneman, & Kunreuther, 1994).

Scenario 1

- Suppose that the threat of terrorist explosives became a reality on the University of Central Florida campus. Trained explosives detection dogs have been shown to be much more effective at locating these dangerous devices. However, state funding would not cover this expense. If students and faculty want this service, they would have to pay for it themselves. How much would YOU be willing to pay per month to reduce the threat of explosives on campus \$ _____.

Scenario 2

- Suppose that crime increased dramatically on the University of Central Florida campus. Police dogs have been shown to reduce both drug use and violent crime. However, state funding will not cover this expense. If students and faculty want this service, they will have to pay for it themselves. How much would YOU be willing to pay per month to reduce crime on campus
\$ _____.

Comparison of Bids

	<u>Drug Dog</u>	<u>Bomb Dog</u>
Mean	\$ 7.01	\$7.77
Zero bids	25%	20%
\$ 1.00 ≤	73%	78%
\$ 5.00 ≤	28%	33%
\$10.00 ≤	15%	14%
\$20.00 ≤	4%	6%

Interpreting the Data

- The aggregate social value is the mean times the number of potential contributors (Green, Kahneman, & Kunreuther, 1994).
- This value is for 24 hours a day, seven days a week service.

Aggregate Values

- 41,102 students x \$7.77 = Bomb dog service
- 41,102 students x \$7.01 = Drug dog service

- Bomb dog \$319,362
- Drug dog \$288,125

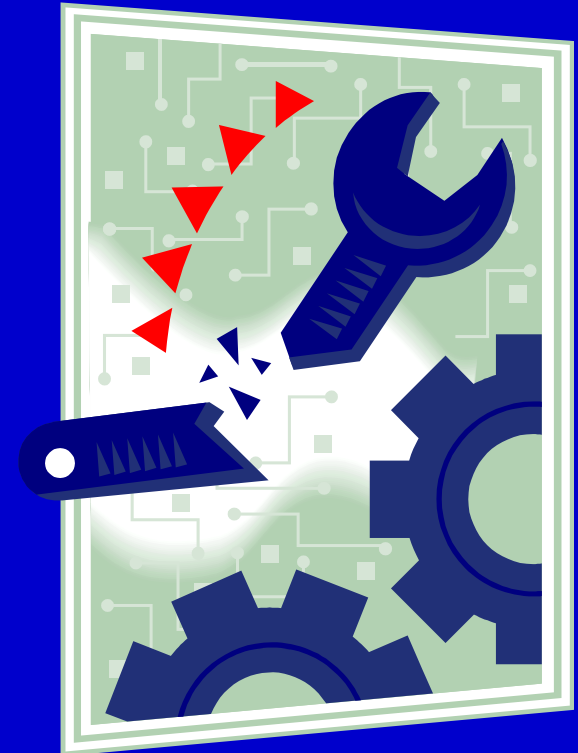
Zero bids

- 15% –50% of responses
- Debate over zero bids
- Number of reasons for zero bids (Halstead et al. 1992; Lindsey 1994; Jorgensen and Syme 2000)
- Frequently referred to in the literature as protest bids (Bowker et al., 2003)



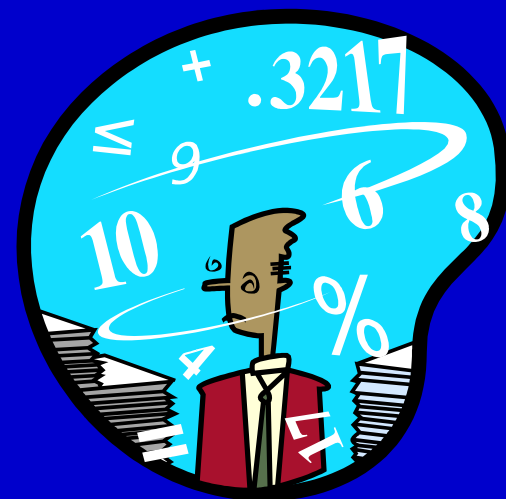
Problems in CV

- Distributions are almost always positively skewed
- Large number of zero bids creates issues for OLS regression
- Zero bids lower the mean value



Options for Statistical Analysis

- Measure as dichotomous within specific threshold values(Pouta & Rekola, 2001)
- Eliminate zero bids
- Collapse into new variable and recode
- In the end, we added \$.01 to each bid and used a log 10 transformation



Correlations Between Measures

<u>Variables</u>	<u>Drug Cost</u>	<u>Bomb Cost</u>
Drug Cost	1.000	.733**
Bomb Cost	.733**	1.000
Crime Reduction	-.273**	-.248**
Deter drugs	-.301**	-.245**
Waste of \$\$\$.281**	.283**

Note. **p < .01. (two tailed)

Theoretical basis

- In social psychological terms, contingent valuations can be considered behavioral intentions (Heberlein and Bishop 1986).
- The application of the theory of planned behavior in the case of CV could be illustrated as a flow chart.
- However, OLS regression to determine the fit of the model.

Table 2: OLS Regression of Factors Associated with Willingness to Pay for Police Canine Services

Variable	<u>DRUG DOG COST</u>			<u>BOMB DOG COST</u>		
	B	SE	β	B	SE	β
Marijuana use	-.138	.043	-.151***	-.034	.040	-.039
Cocaine use	.008	.158	.002	-.302	.150	-.089*
Perceived ability	-.171	.062	-.121**	-.152	.058	-.114**
Legal knowledge	-.087	.038	-.105*	-.089	.036	-.113*
Media construction	-.037	.051	-.031	-.074	.048	-.066
Fear of dogs	.437	.139	.140**	.650	.132	.220***
Gender	.206	.113	.082	.230	.107	.097*
Fear index	-.018	.016	-.051	-.020	.015	-.060
Police index	-.054	.020	-.124**	-.028	.018	-.066
White	-.096	.188	-.035	.096	.178	.037
Black	-.080	.231	-.021	.069	.218	.019
Hispanic	-.238	.266	-.061	-.202	.254	-.043
F	6.58***			6.84***		
R	.374			.380		
R ²	.140			.144		

Conclusions

- Created a hypothetical market
- Identified a surprising amount of support and has provided a benchmark for future planning
- CV has obvious potential for use in criminal justice evaluation.



However...

- Baseline may be affected by 9-11 fear
- Support may be affected by proactive effort on the part of police
- The rationale behind the zero bid should further explored

