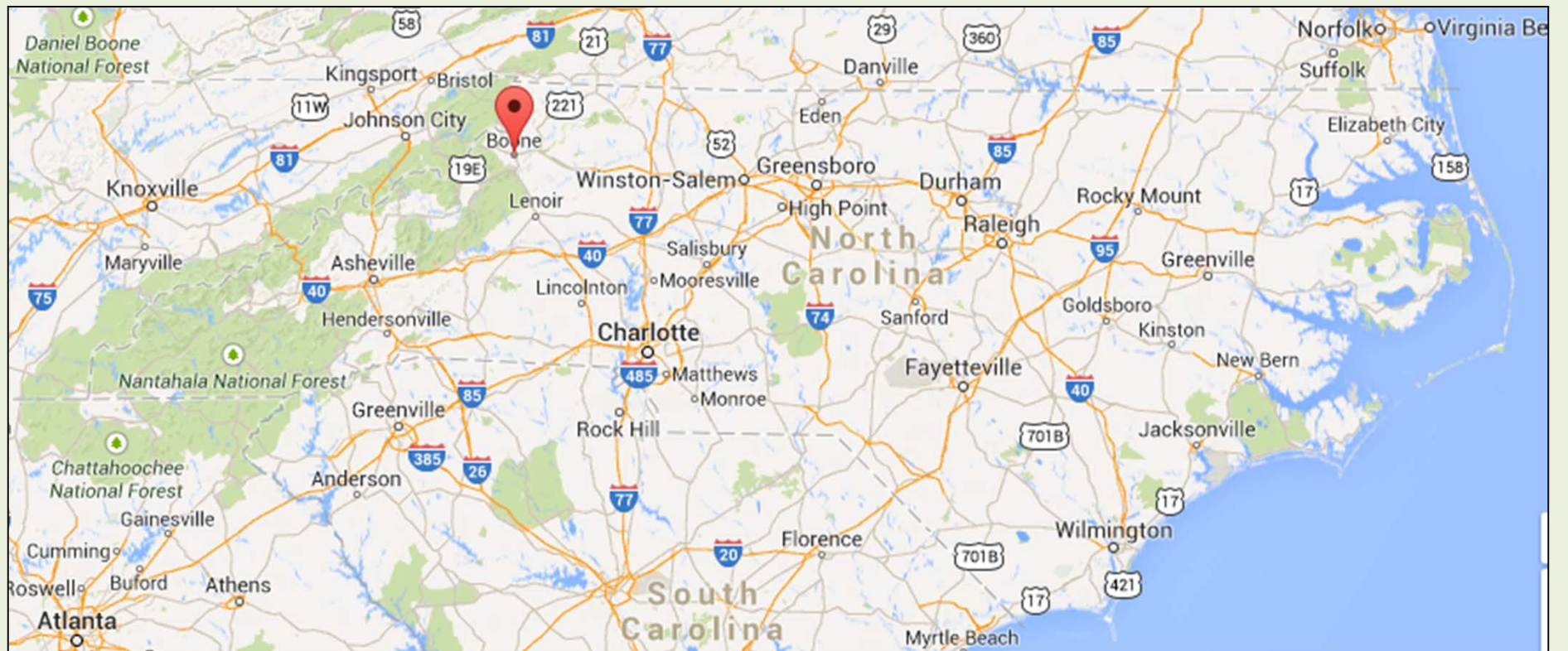


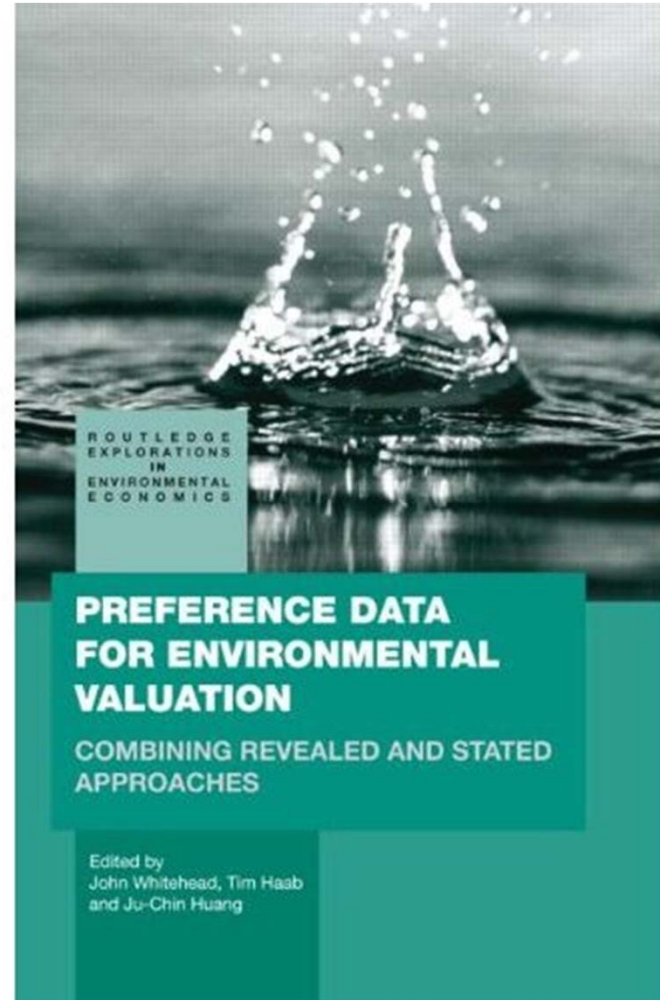
Mitigating Hypothetical Bias in Stated Preference Data

John Whitehead
Appalachian State University
Boone, NC



Preference Data for Environmental Valuation

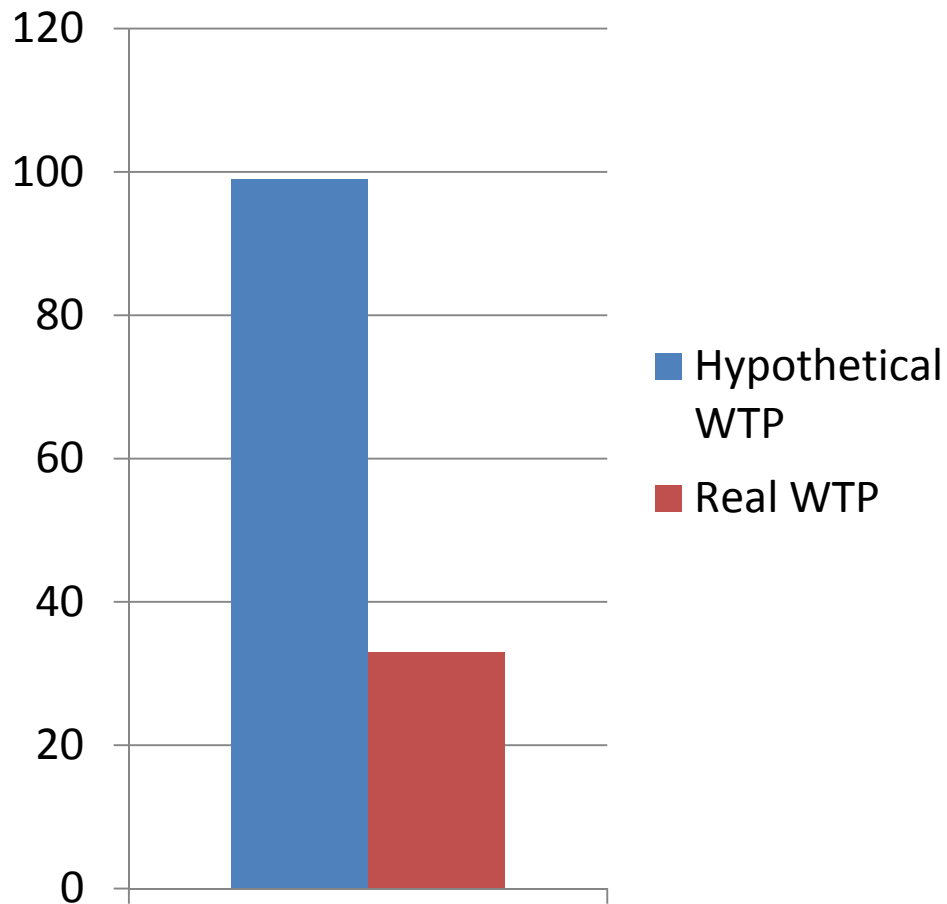
- Revealed preference
 - Travel cost method
 - Hedonic price method
 - Averting behavior method
- Stated preference
 - Contingent valuation
 - Choice experiments
 - Contingent behavior



Hypothetical Bias

- Free-riding
- Strategic bias
- “Ask a hypothetical question, get a hypothetical answer”

Evidence from CVM Meta-Analyses



- List and Gallet, *ERE* (2001)
- Little and Berrens, *EconBull* (2004)
- Murphy et al. *ERE* (2005)

November 6, 2012

Journal of Economic Perspectives

Vol. 26, Issue 4

Fall 2012

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Symposium

Contingent Valuation

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Contingent Valuation: A Practical Alternative When Prices Aren't Available (#3)

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Contingent Valuation: From Dubious to Hopeless (#4)

Jerry Hausman

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Contingent Valuation: From Dubious to Hopeless

Jerry Hausman

Approximately 20 years ago, Peter Diamond and I wrote an article for this journal analyzing contingent valuation methods (Diamond and Hausman 1994). At that time Peter's view was that contingent valuation was hopeless, while I was dubious but somewhat more optimistic. But 20 years later, after millions of dollars of largely government-funded research, I have concluded that Peter's earlier position was correct and that contingent valuation is hopeless.

Dubious to Hopeless

- “three long-standing problems continue to exist” (p. 43)

–Hypothetical bias

- WTP vs WTA
- Scope

Featured Article

From Hopeless to Curious? Thoughts on Hausman's "Dubious to Hopeless" Critique of Contingent Valuation

Timothy C. Haab*, Matthew G. Interis, Daniel R. Petrolia, and John C. Whitehead

Timothy C. Haab is a professor and department chair, Department of Agricultural, Environmental and Development Economics, The Ohio State University. Matthew G. Interis is an assistant professor and Daniel R. Petrolia is an associate professor, both in the Department of Agricultural Economics, Mississippi State University. John C. Whitehead is a professor and department chair, Department of Economics, Appalachian State University.

*Correspondence may be sent to: haab.1@osu.edu.

Submitted 11 June 2013; accepted 16 September 2013.

Abstract *Hausman "selectively" reviewed the contingent valuation method (CVM) literature in 2012 and failed to find progress in the method during the 18 years since Diamond and Hausman argued that unquantified benefits and costs are preferred to those quantified by CVM. In this manuscript, we provide counter-arguments to Hausman's claims, not with the intent to convince the reader that the debate over CVM is settled in favor of the method, but rather to argue that the intellectual debate over CVM is ongoing, that dismissing CVM is unwarranted, and that plenty of work remains to be done for the truly curious researcher.*

Key words: Contingent valuation method, Nonmarket valuation.

JEL codes: D6, H4, Q51.

Hausman (2012) “selectively reviews the literature”

- Jamieson and Bass, *J. of Marketing Res.* (1989)
 - Hsiao et al. *Advances in Econometrics* (2002)
 - Morwitz et al. *Int’l J. of Forecasting* (2007)
-

- None of the studies find an overstatement
- The purpose of each is to improve the accuracy of stated preference data

Criterion Validity

- Bishop and Heberlein, *AJAE* (1979)
- Dickie, Fisher and Gerking, *JASA* (1987)
- Loomis, *ERE* (1993)
- Grijalva et al. *AJAE* (2002)

Hypothetical bias mitigation approaches

- Bias Functions
- Cheap talk
- Follow-up certainty questions
- Consequentiality
- Joint estimation

Bias Functions

- Blackburn, Harrison and Rutstrom, *AJAE* (1994)
- Fox et al., *AJAE* (1998)
- Mjelde et al., *JEM* (2012)

Cheap talk

- Cummings and Taylor *AER* (1999)
- List *AER* (2001)
- Lusk *AJAE* (2003)
- Landry and List *AJAE* (2007)

How much do you think you would bid (minimum of \$100)? Please enter a number rounded to the dollar (for example, 100 instead of 100.25).

Sometimes when people are asked a question like this one, it is easy for them to say they would pay something because they are not being asked to pay at the same time, or they don't think they will have to pay based on their response.

We want you to only respond with what you actually think you would do in this situation.

Also consider your personal income and current payment obligations. If you say you will pay more for an early registration then you would have less money to spend on other things this year.

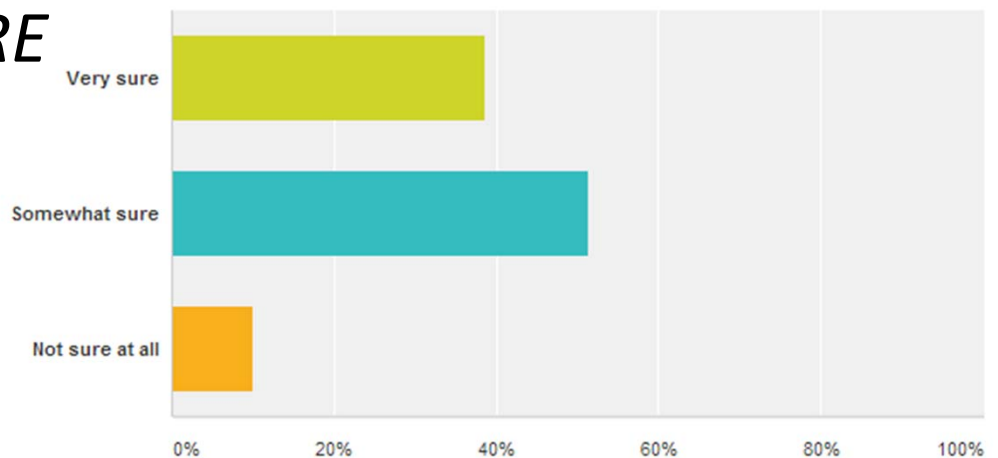
Dollars (please enter a number, for example 100 instead of \$100)

Follow-up certainty questions

- Champ, Bishop and Brown, *JEEM* (1997),
- Champ and Bishop, *ERE* (2001)
- Blumenschein et al. *Econ. J.* (2007)

How sure are you that this would be your bid?

Answered: 70 Skipped: 307



Answer Choices	Responses
Very sure	38.57% 27
Somewhat sure	51.43% 36
Not sure at all	10% 7
Total	70

Consequentiality

- Theory
 - Carson and Groves, *ERE* (2007)
- Evidence
 - Landry and List, *AJAE* (2007)
 - Vossler, Doyon and Rondeau, *AEJ: Policy* (2012)
 - Vossler and Watson, *JEBO* (2013)

Joint Estimation

- Without the criterion variable
 - Whitehead, Haab and Huang, *REE* (2000)
 - Whitehead et al., *MRE* (2008)
 - Whitehead et al., *Econ. Inq.* (2013)
- With the criterion variable
 - Grijalva et al., *AJAE* (2002)
 - Whitehead, *ERE* (2005)
 - Whitehead, Noonan and Marquardt (2014)
 - Whitehead, Groothuis and Weddell (2014)
 - Atkinson and Whitehead (2014)

RP-SP Models

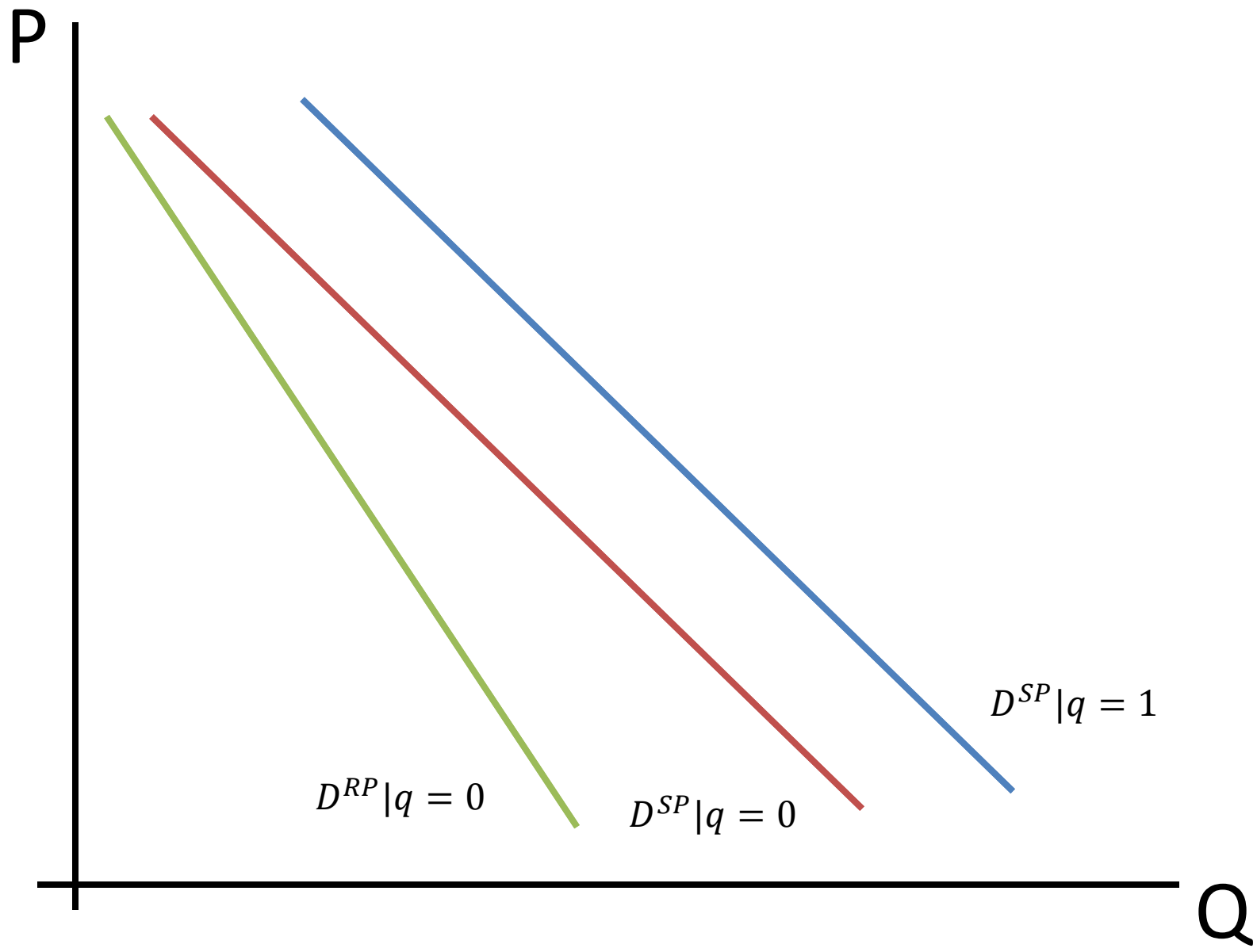
- RP: $Q_R = \alpha_0 + \alpha_1 P$

- SP: $Q_S = \beta_0 + \beta_1 P + \beta_2 q$

- RP-SP ($j = R, S$):

$$Q_j = \gamma_0 + \gamma_1 SP + \gamma_2 P + \gamma_3 (P \times SP) + \gamma_4 q$$

- Hypothetical bias: $\gamma_1 > 0, \gamma_3 > 0$



MRE (2008)

Table 2
Stated and Revealed Preference Random Effects Poisson Beach Recreation Demand

Variable	Model 1		Model 2		Model 3	
	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio
Constant	2.0247	21.32	1.8167	18.61	1.8168	18.62
Own-price	-0.0106	-15.79	-0.0114	-16.19	-0.0114	-15.65
Cross-price	0.0042	7.15	0.0046	7.82	0.0046	7.67
Income	0.0051	4.05	0.0079	6.01	0.0079	5.45
SP status quo ^a	0.1664	15.26	0.4244	17.58	0.4092	16.74
SP improved access ^b	0.2634	23.65	0.2634	23.34	0.3033	23.44
SP increased width ^c	0.0727	3.68	0.0727	3.62	0.0727	3.54
Own-price × SP			0.0010	10.51	0.0013	10.81
Cross-price × SP			-0.0005	-4.43	-0.0006	-4.37
Income × SP			-0.0034	-14.37	-0.0034	-13.83
Own-price × SP improved access					-0.0007	-5.03
α	1.12	14.60	1.12	14.38	1.12	14.27
LL	-8,210.81		-8,175.86		-8,169.50	
Cases	636		636		636	
Periods	4		4		4	

^a Dummy variable for all SP scenarios.

^b SP dummy variable for scenario 2.

^c SP dummy variable for scenario 3.

Whitehead (2005), Footnote 1

- “Generally, I do not think the context lends itself to addressing predictability of stated behavior.
- The dichotomous choice nature of the stated behavior is simplistic and the stated behavior following an actual event is problematic.
- The fact that respondents had prior experience with the choice during the ex ante survey period only magnifies the fact that respondents already had substantial familiarity and experience with this choice – a choice that is weighty and worth remembering.
- As the authors state, a comparison between stated and actual behavior is trivial if the choices are known. This is the case in this instance.
- The analysis is weak and any inference is dubious.”



Department of Economics Working Paper

Number 12-05 | November 2012

Criterion and Predictive Validity of Revealed and Stated Preference Data: The Case of Music Concert Demand

John Whitehead
Appalachian State University

Douglas Noonan
*School of Public Policy
Georgia Institute of Technology*

Elizabeth Marquardt
Appalachian State University

2010 Survey

- Email addresses collected at concert intermission
- Survey Monkey internet survey



Mountain Home Music 2010 Survey! Sign up below

- This survey is being conducted by faculty and students in the Department of Economics at Appalachian State University in cooperation with Mountain Home Music.
- The purpose of the survey is to give members and fans of Mountain Home Music an opportunity to:
 - identify strengths and weaknesses
 - share ideas that may help us develop strategies in key areas such as concerts and venues.
- The survey should take only about 10-15 minutes to complete. Your participation is completely voluntary. The information we are requesting will be used only for research purposes. No one will be identified in any reports coming out of the survey.
- If you have any questions about this study, you may contact Dr. John Whitehead at Appalachian State University: 828-262-6121 or whiteheadjc@appstate.edu.



Thanks!

As a token of our appreciation for your time, all who participate can enter into a random drawing for a pottery mug from Patti Carmen Pottery (www.patticarmen.com).

The winner will be notified at the end of the Mountain Home Music season.

Date	Attendance	Emails	Responses	Population Response Rate	Sample Response Rate
May 30	225	NA	10	4%	NA
June 5	93	12	10	11%	83%
June 12	182	5	4	2%	80%
June 19	74	7	5	7%	71%
June 26	161	14	12	7%	85%
August 7	145	11	6	4%	54%
September 5	212	22	18	8%	81%
October 9	98	21	14	14%	67%
October 16	110	13	6	5%	46%
December 18	150	12	9	6%	75%
Total	1450 (58%)	117	94	6%	72%

Mountain Home Music: 2010 Follow-up Survey

[Design Survey](#)[Collect Responses](#)[View Summary](#)[Edit Recipients](#)[Edit Messages](#)[Change Settings](#)[Rewards](#)[Change Restrictions](#)[Close Collector Now](#)[New Email Invitation](#) [Edit](#)[Email Invitation](#)**OPEN**

Email Collector

Recipients

[Edit Recipients](#)

Total Count:	123
Unsent/New:	0
Sent:	123
Responded (Partial/Complete):	65 (2 / 63)
Unresponded:	58
Opted Out:	0
Bounced:	1

Messages

[Edit Messages](#)

Total Messages:	2
Drafts:	0
Scheduled:	0
In Progress:	0
Mailed:	2

Sample Characteristics

Variable	Follow-up Survey Respondents with SP data (n=38)	Other Respondents (n=45)
Household Size	2.21	2.09
Party Size	2.76	2.89
Budget	\$520	\$425
Age	65	62
Year round resident	39%	60%
Seasonal resident	50%	31%

Concert Demand Data (n=38)

Scenario	Year	Price	Typical	SP	Concerts
1	2009	15	0	0	4.05
2	2010	15	0	0.65	5.74
3	Typical	15	1	0	4.79
4	2011	18	0	1	4.34
5	2011	25	0	1	3.18
6	2010	15	0	0	3.58

Nonparametric Criterion Validity Test

- $\Delta Q = Q_T^{rp} - (Q_t^{rp} + Q_t^{sp})$
- $n=38$
 - $n=2$: $\Delta Q = 0$
 - $n=5$: $\Delta Q < 0$ (understated attendance)
 - $N=31$: $\Delta Q > 0$ (overstated attendance)
 - ΔQ : mean = 2.25, median = 2, mode = 1, min = -5, max = 8
 - $\Delta Q \neq 0$; signed rank test: $p=.0001$

Parametric Criterion Validity Test

- Dependent variable:
 - $\Delta Q^{rp} = Q_T^{rp} - Q_t^{rp}$
- Independent variable:
 - Q_t^{sp}
- Model:
 - $\Delta Q^{rp} = \alpha + \beta Q_t^{sp}$

Coefficient	Estimate
α	0.16
	(0.44)
β	0.42*
	(0.08)
n = 38, R ² = 0.41	

Predictive Validity Test

- Fixed effects model (Cameron and Englin, 1996)

$$\ln Q_{it} = \alpha_i + \beta_P P + \beta_{SP} SP + \beta_{Typical} Typical + \varepsilon_{it}$$

- Marginal effect: $\frac{\partial Q}{\partial SP} = \beta_{SP} \bar{Q}$

Fixed Effects Model

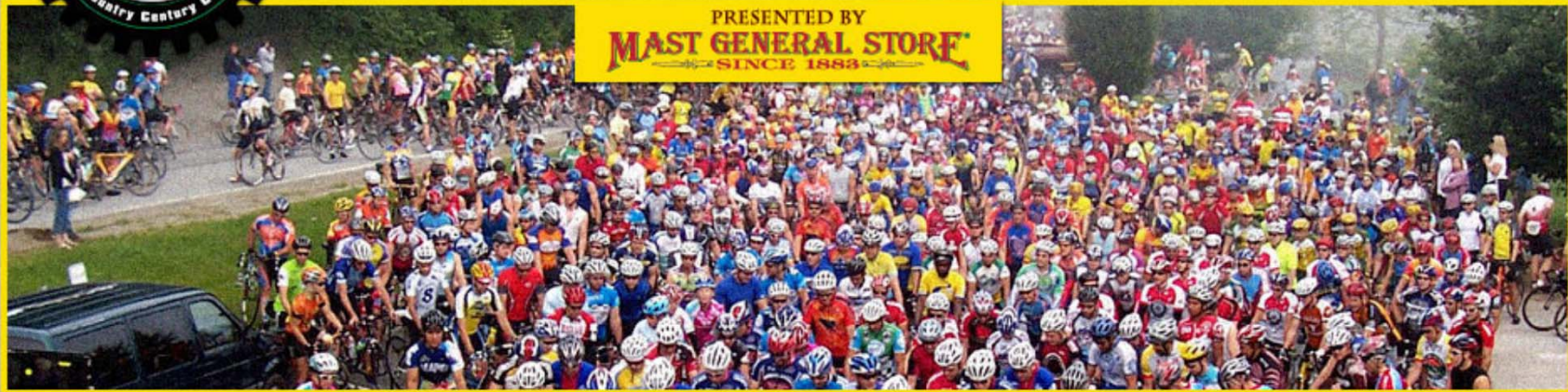
Variable	Coefficient	Standard Error	Marginal Effects	95% Confidence Interval
Price	-0.068	0.013	-0.303	[-0.41, -0.19]
SP	0.385	0.112	1.703	[0.73, 2.67]
Typical	0.161	0.103	0.712	[-0.20, 1.62]
Cases	38			
Periods	5			
Sample size	190			

MHM: Conclusions

- Difference between ex-ante stated and ex-post revealed concerts is 2.26 (n=38).
- The 95% confidence interval on the stated preference adjustment factor is [0.73, 2.67].
- The RP-SP model with SP adjustment would predict accurately.



The 16th Annual Blood Sweat & Gears - Saturday June 28TH



FLANIGAN PIPES
LAND & COMMERCIAL PROPERTIES



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[Packet Pickup](#)

[Ride Photos](#)

[Results](#)

[Ride Details](#)

[Schedule of Events](#)

Ride Details

Description: The BSG is a full English century - 100 mile loop ride starting and ending at the Valle Crucis Elementary School, approximately 5 miles south of Boone, North Carolina. The cumulative climbing elevation is 8,800 feet (as measured by a Garmin Edge 500...thanks to Dave Wright), with the climb up to the gap at Snake Mountain, milepoint 63, reaching an 18-20% grade near the top. Riders reaching the Cove Creek aid station (milepoint 82) after 2:00pm will be directed to the finish at Valle Crucis, resulting in a total distance ride of 87 miles.

Half Century: We will use the same 50 mile route as 2011. It includes the last 28 miles of the century route. Some of the local riders have told us that the new sections are among some of the

FOLLOW US:







Blood Sweat and Gears: 2011 Survey

 **SurveyMonkey®** whiteheadjc ▾

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Blood Sweat and Gears Participant Survey

Design Survey

Collect Responses

Analyze Results

STATUS: **CLOSED**

Overview

Recipients

Messages

Change Settings

Rewards

Change Restrictions

Open Collector Now

Email Invitation [Edit](#)

Overview

Recipients

TOTAL 1156

Sent		1156
Unresponded	595	Send Reminder Email
Responded	561	
Partial/Complete	23 / 538	
Opted Out	11	
Bounced	16	
Unsent		0

[View Recipients](#)

Messages

TOTAL 3

Drafts		0
Scheduled		0
In progress	0	
Mailed	3	

[View Messages](#)



[Exit this survey](#)

Blood Sweat and Gears Participant Survey

100 mile ride

Proceeds from the 2012 ride will benefit two charities established by the Watauga County Chapter of the American Red Cross. The Jeremy Dale Fisher Fund and The Russell Fund provide assistance to local families that are displaced by fire, flood or similar disasters.

The 100 mile route has a limit of 750 riders and sold out in one day in 2011. One proposal being considered is to charge a higher entrance fee in order to provide even more assistance to local families.

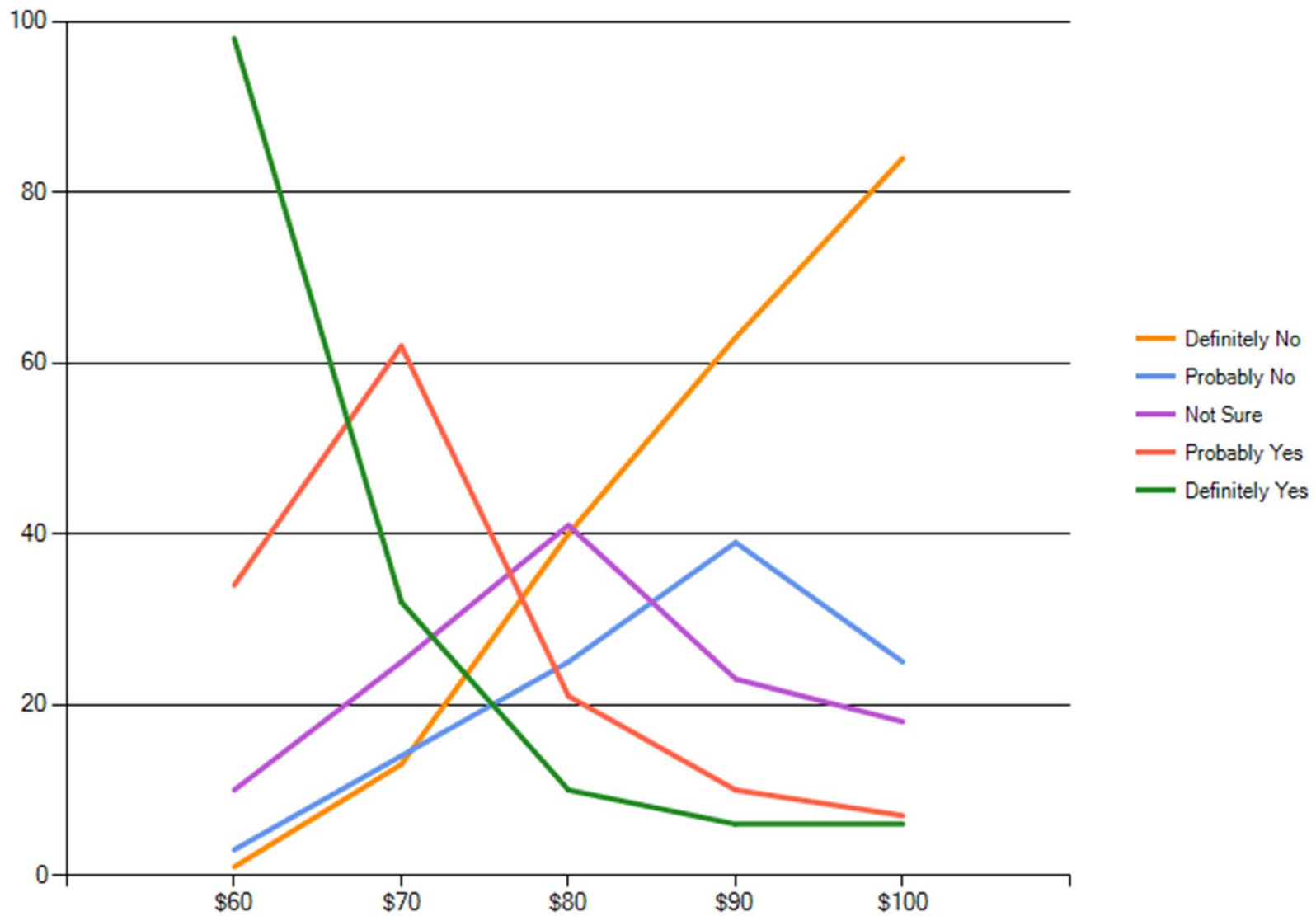
1. Would you be willing to pay the following entrance fees for the 2012 ride if you knew all of the additional funds went to charity?

	Definitely No	Probably No	Not Sure	Probably Yes	Definitely Yes
\$60	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$70	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$80	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$90	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1. Would you be willing to pay the following entrance fees for the 2012 ride if you knew all of the additional funds went to charity?

	Definitely No	Probably No	Not Sure	Probably Yes	Definitely Yes	Rating Count
\$60	0.0% (0)	0.3% (1)	5.5% (19)	23.1% (80)	71.4% (247)	346
\$70	5.9% (21)	5.6% (20)	15.4% (55)	36.9% (132)	36.6% (131)	358
\$80	16.8% (58)	17.7% (61)	26.4% (91)	24.1% (83)	16.2% (56)	345
\$90	32.4% (113)	24.1% (84)	20.9% (73)	12.0% (42)	10.9% (38)	349
\$100	44.2% (159)	19.7% (71)	15.3% (55)	8.3% (30)	13.1% (47)	360
					answered question	381
					skipped question	180

Would you be willing to pay the following entrance fees for the 2012 50 mile ride if you knew all of the additional funds went to charity?



RP and SP BSG Participation

		2011 SP		2012 RP
		Definitely Yes	Probably Yes	Actual
SP	\$60	68%	93%	
SP	\$70	33%	69%	
RP	\$70			42%
SP	\$80	14%	35%	

Individual Predictions: Definitely Yes

Frequency Percent	Table of part12sp5 by part12rp			
	part12sp5(definitely yes at \$70)	part12rp(participated in 2012 BSG)		
		0	1	Total
0	195 38.77	144 28.63	339 67.40	
1	96 19.09	68 13.52	164 32.60	
Total	291 57.85	212 42.15	503 100.00	

Individual Predictions: Probably Yes

Sample Size = 503

Frequency Percent	Table of part12sp4 by part12rp		
	part12sp4(probably yes at \$70)	part12rp(participated in 2012 BSG)	
		0	1
0	94 18.69	62 12.33	156 31.01
1	197 39.17	150 29.82	347 68.99
Total	291 57.85	212 42.15	503 100.00

RP and SP 2011-2012 Participation

				Participation		
Year	Cases	SP	Fee	Definitely Yes	Probably Yes	Not Sure
2011	1923	0	60	60%		
2012	316	1	60	56%	90%	98%
2012	412	1	70	22%	66%	84%
2012	383	1	80	6%	32%	64%
2012	332	1	90	1%	15%	44%
2012	305	1	100	15%	26%	50%
2012	1923	0	70	61%		

Fixed Effects Probit Participation Models

	Definitely	Definitely and Probably	Definitely, Probably and Not Sure
	Coeff.	Coeff.	Coeff.
FEE	-.0415*	-.0576*	-.0503*
SP (0, 1)	-1.119*	0.0122	.663*

BSG: Conclusions

- Demand model with uncertain respondents would predict accurately.
- Caveat: CB/WTP question is not incentive compatible
 - WTP studies have found that only the definitely respondents would actually pay.

Rocky Knob Mountain Bike Park

Boone's Mountain Bike Park



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Trip Report: RKP and the Summer of Rain

Posted on [November 7, 2013](#) by [Kristian Jackson](#)

Guest blogger: Micheal Hakala

Photos by TJ Kearns

After driving 6+ hours from Atlanta to Boone in what could be described as the start of the second biblical floods we finally arrived to our hotel at Beech Mountain. With that amount of rain I was thinking that there was no way we were going to get any solid riding in the High country that weekend and others in the group were kind of questioning it as well. Maybe it will clear up in the morning. Not so much.

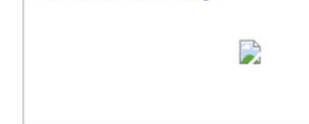


We got on the trails after a stupid amount of rain and the sky kind of cleared up with Scott, Josh, TJ, Kristian, and his mini shredders in the making. First reaction was 'holy crap these trails are



Interactive Map

[Interactive Trail Map](#)



Elevation Profile Tool



RKP Video

Rocky Knob (n=68)

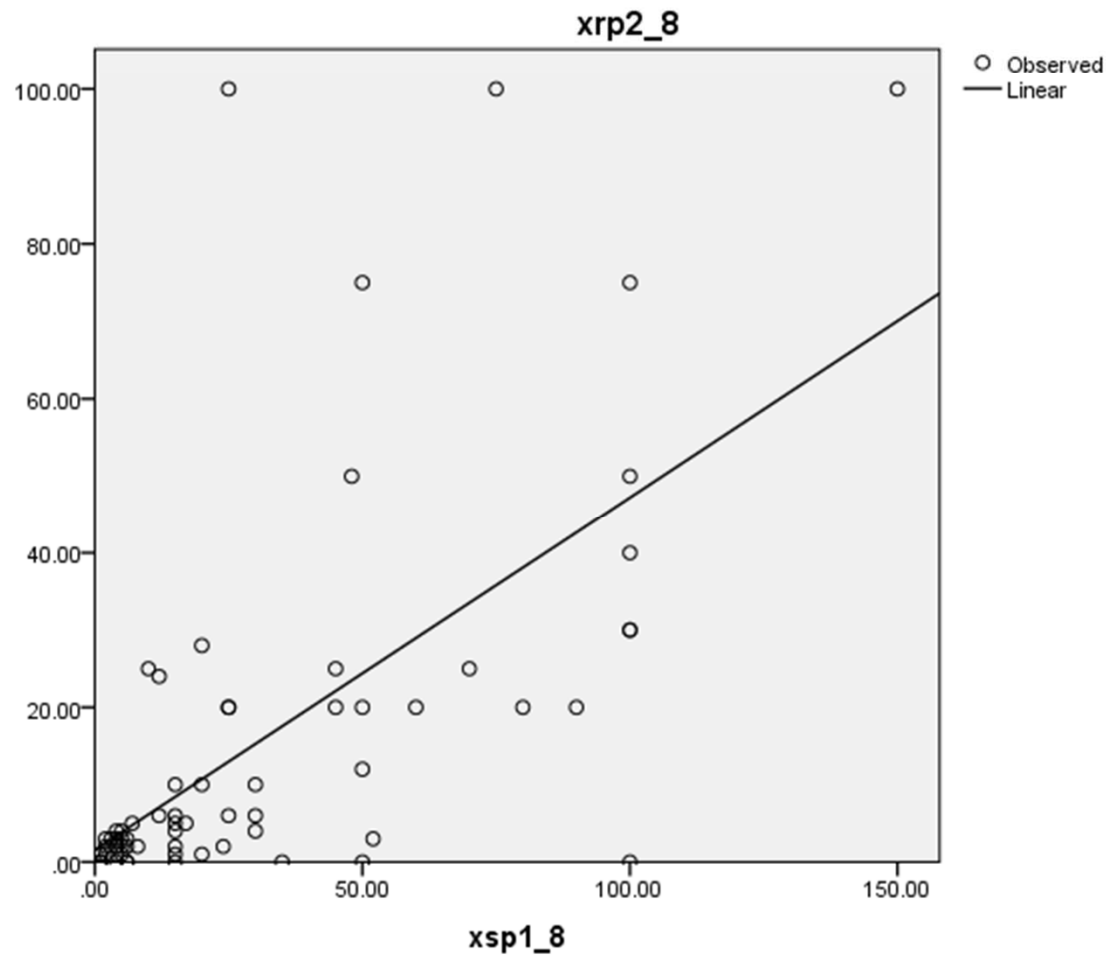
Time	SP	Trail Miles	Trips	Rain	Temp
1	0	3.8	13.29	5.46	60.39
2	1	6	24.66	5.46	60.39
3	1	8	30.54	5.46	60.39
4	0	7.8	15.51	7.27	58.88
5	1	7.8	20.25	7.27	58.88

Model Summary and Parameter Estimates

Dependent Variable: xrp2_8

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	.403	44.579	1	66	.000	1.574	.456

The independent variable is xsp1_8.



Negative Binomial Panel Models

Variable	FIRST		SECOND		BOTH	
	Parameter	t-statistic	Parameter	t-statistic	Parameter	t-statistic
Constant	0.98	3.65	2.62	6.09	0.05	0.14
SP	0.39	1.83	0.32	3.47	0.32	1.66
TRAVCOST	-0.012	-5.87	-0.011	-3.40	-0.006	-2.50
MILES	0.15	2.34			0.16	2.15
BUDGET	-0.08	-0.80	-0.10	-0.74	0.01	0.25
SECOND					-0.56	-3.86
a	1.98	3.54	1.68	3.25	1.37	3.31
b	3.35	2.99	1.23	4.86	3.87	3.00
Cases	68		68		68	
Time Periods	3		2		5	

RKMBP: Conclusions

- Difference between ex-ante stated and ex-post revealed trips is 15 (n=68).
- The 95% confidence interval on the stated preference adjustment factor is [-.63, 18.56].
- The RP-SP model with SP adjustment would predict accurately.

Conclusions

- We provide some evidence that stated preference data can be used to accurately predict behavior.
- More of these before/after studies are needed.

Epilogue

- In 2012, BSG organizers raised the fee to \$70 and generated \$10,000+ for more for charity
- Prima facie evidence that SP data is not hopeless?