Criterion and Predictive Validity of RP and SP Data: The Case of "Mountain Home Music" Concert Demand

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Valuation data

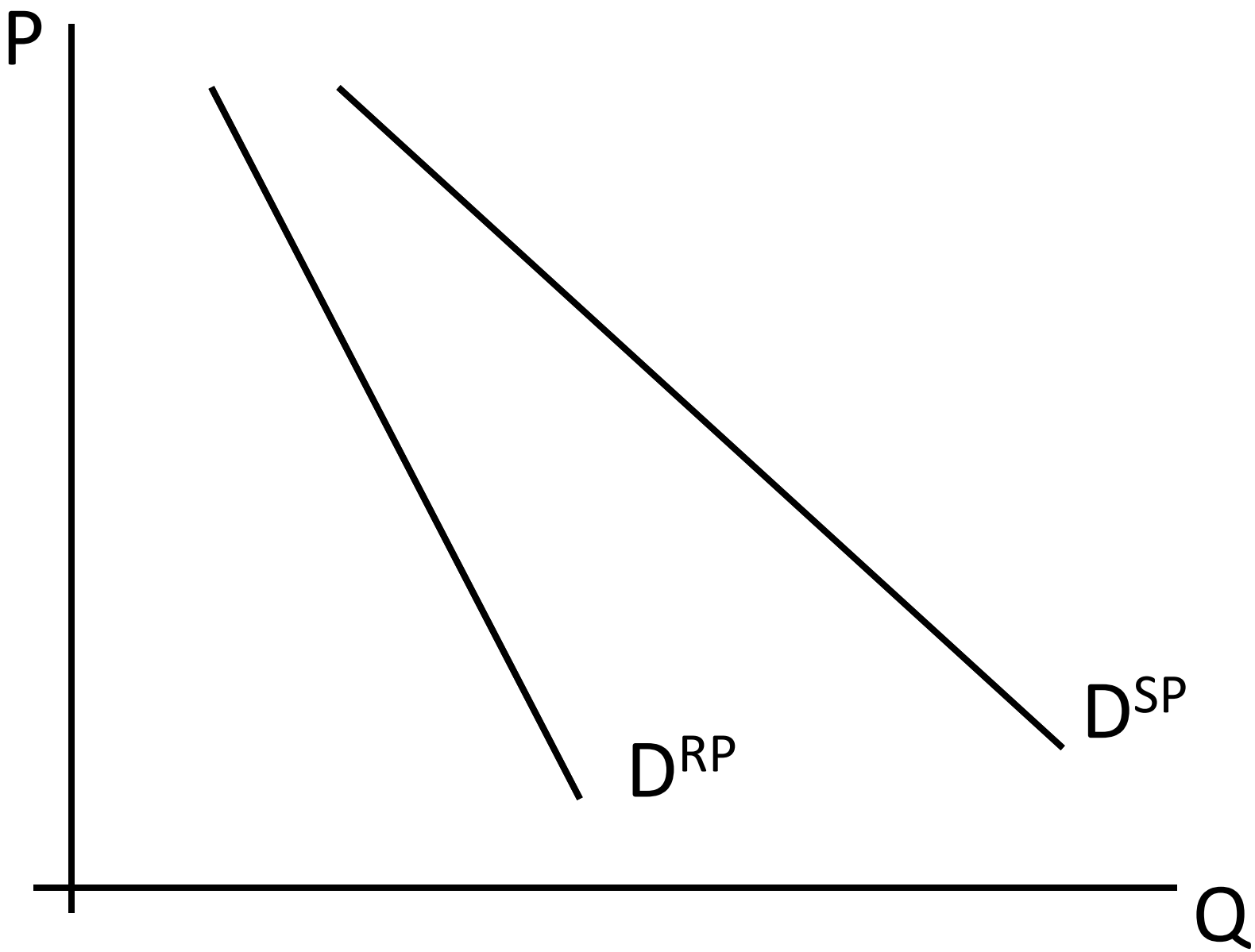
- Revealed preference
- Stated preference
- Revealed-stated preference

Criterion Validity

- Stated WTP = Revealed WTP
  - Bishop and Heberlein (1979)
  - List and Gallet (2001)
  - Murphy et al. (2005)
- Stated Q = Revealed Q
  - Dickie, Fisher and Gerking (1987)
  - Loomis (1993)
  - Whitehead (2005)

RP-SP Models

- RP: $Q_R = \alpha_0 + \alpha_1 P$
- SP: $Q_S = \gamma_0 + \gamma_1 P$
- RP-SP:
  $Q_j = \beta_0 + \beta_1 SP + \beta_2 P + \beta_3 (P \times SP); \mathrm{j} = \mathrm{R}, \mathrm{S}$
- "Hypothetical bias": $\beta_1 > 0, \beta_3 > 0$


P
D^{RP}
D^{SP}
Q

Predictive Validity

- Ex-ante Predicted Q = Ex-post Revealed Q
  - Grijalva et al. (2002)
  - Whitehead (2005)

Purpose

- Conduct criterion validity tests with ex-ante SP, ex-post data for the same time period
- Conduct predictive validity tests with an ex-ante RP-SP model and ex-post RP data

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.

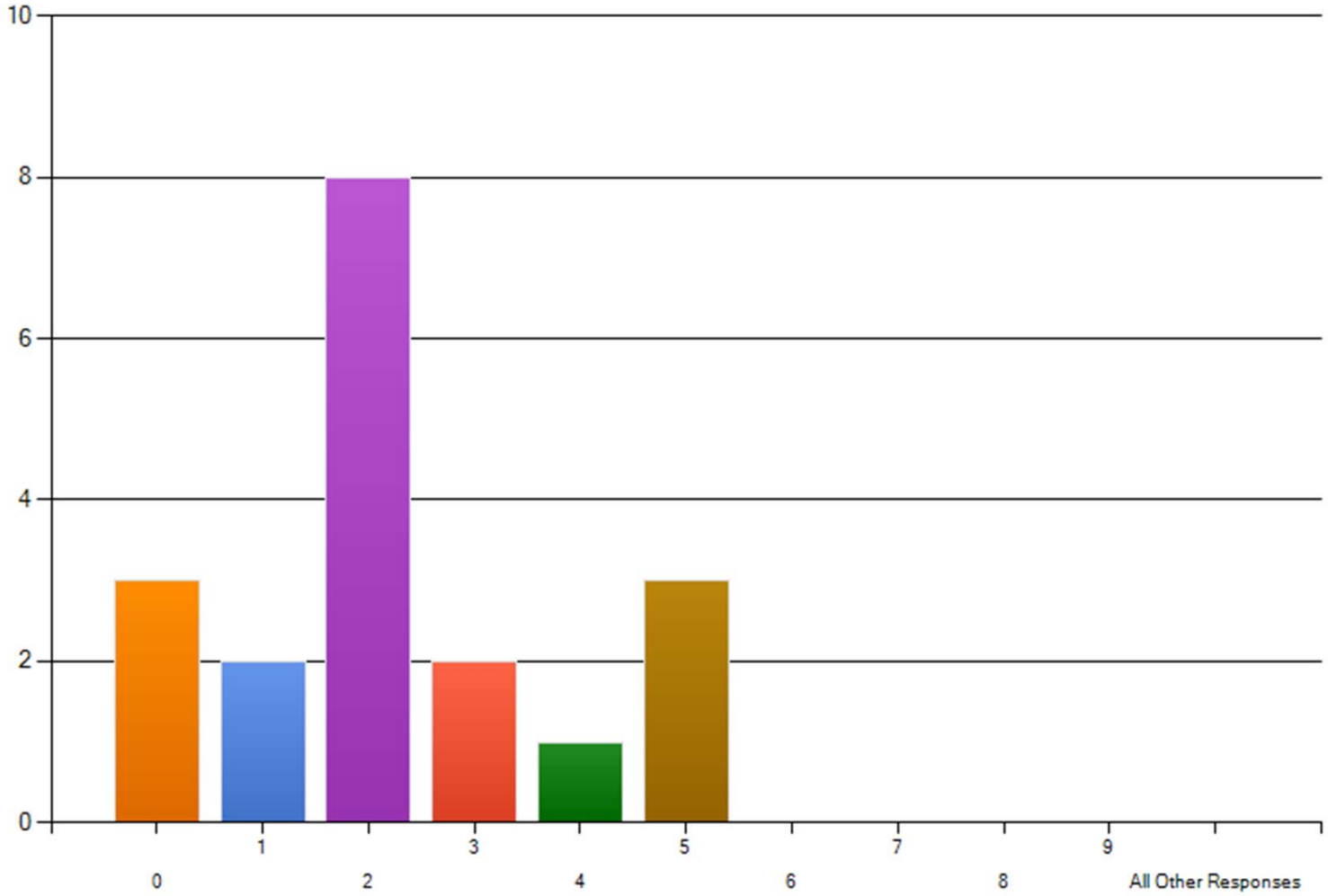
Thanks!

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).

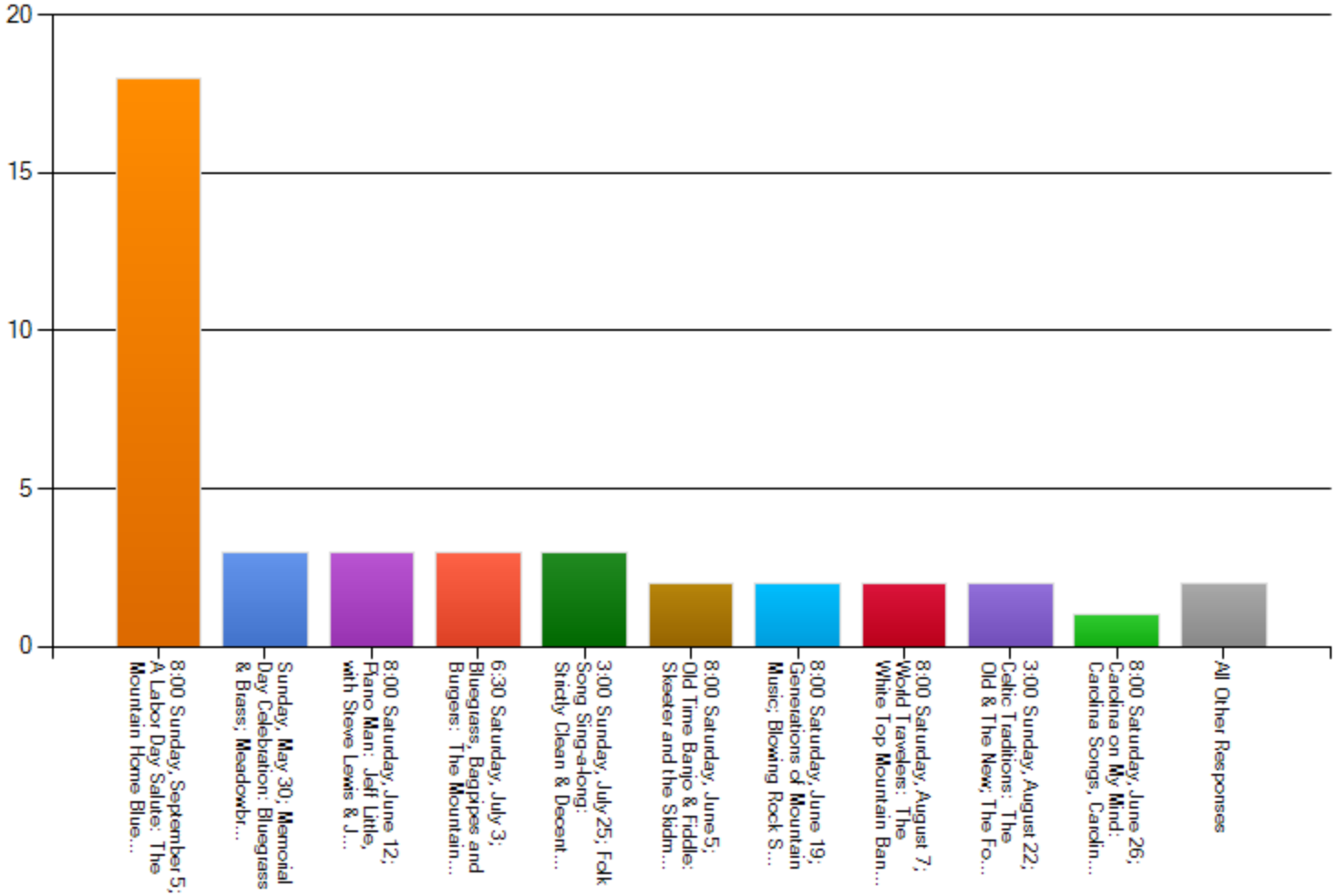
The winner will be notified at the end of the Mountain Home Music season.

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%

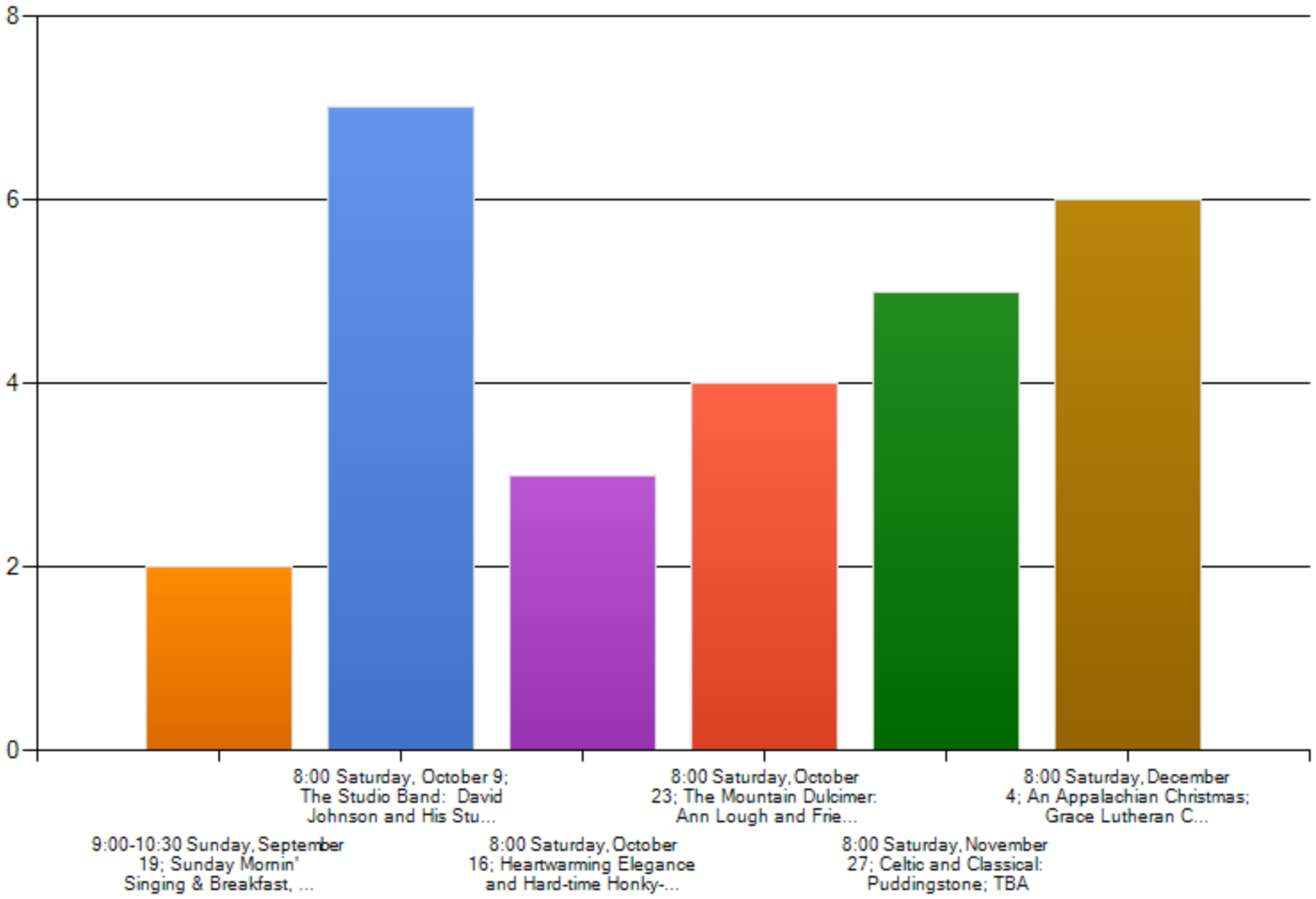
About how many Mountain Home Music concerts did you attend during the 2009 concert season?



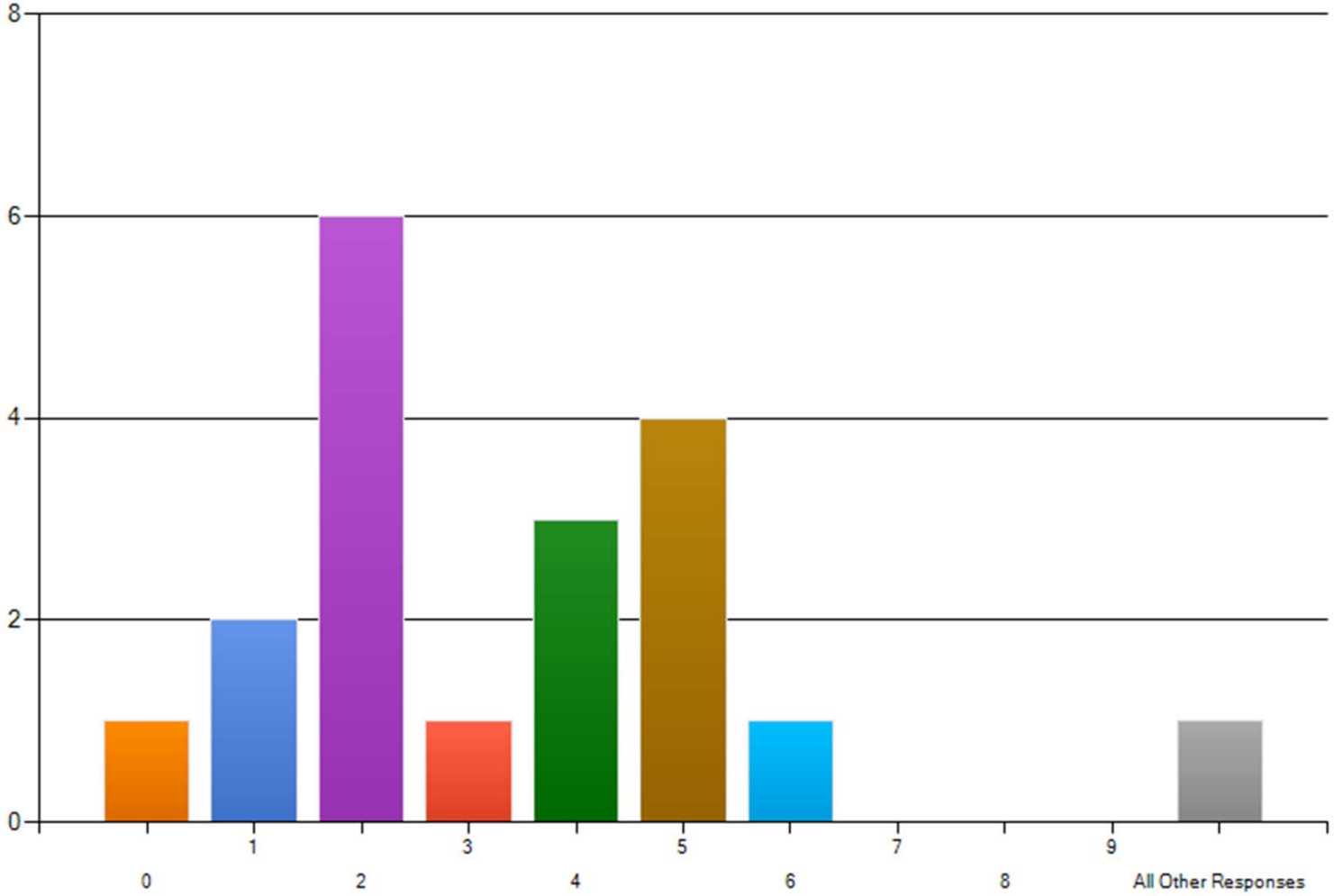
Which Mountain Home Music concerts have you attended during the 2010 concert season?



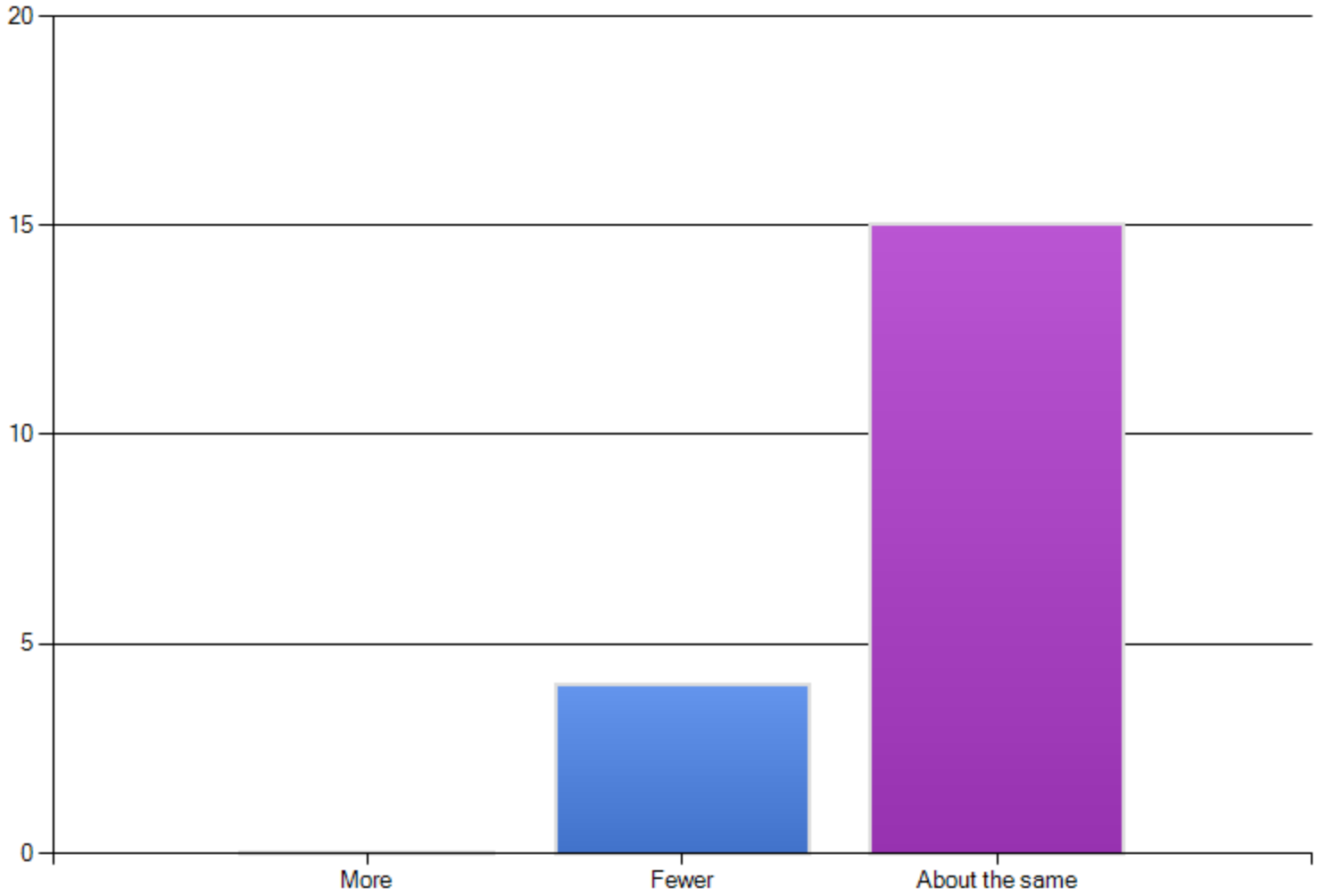
Which Mountain Home Music concerts do you think you will attend during the 2010 Fall and Winter concert season (please check each that you plan to attend)?



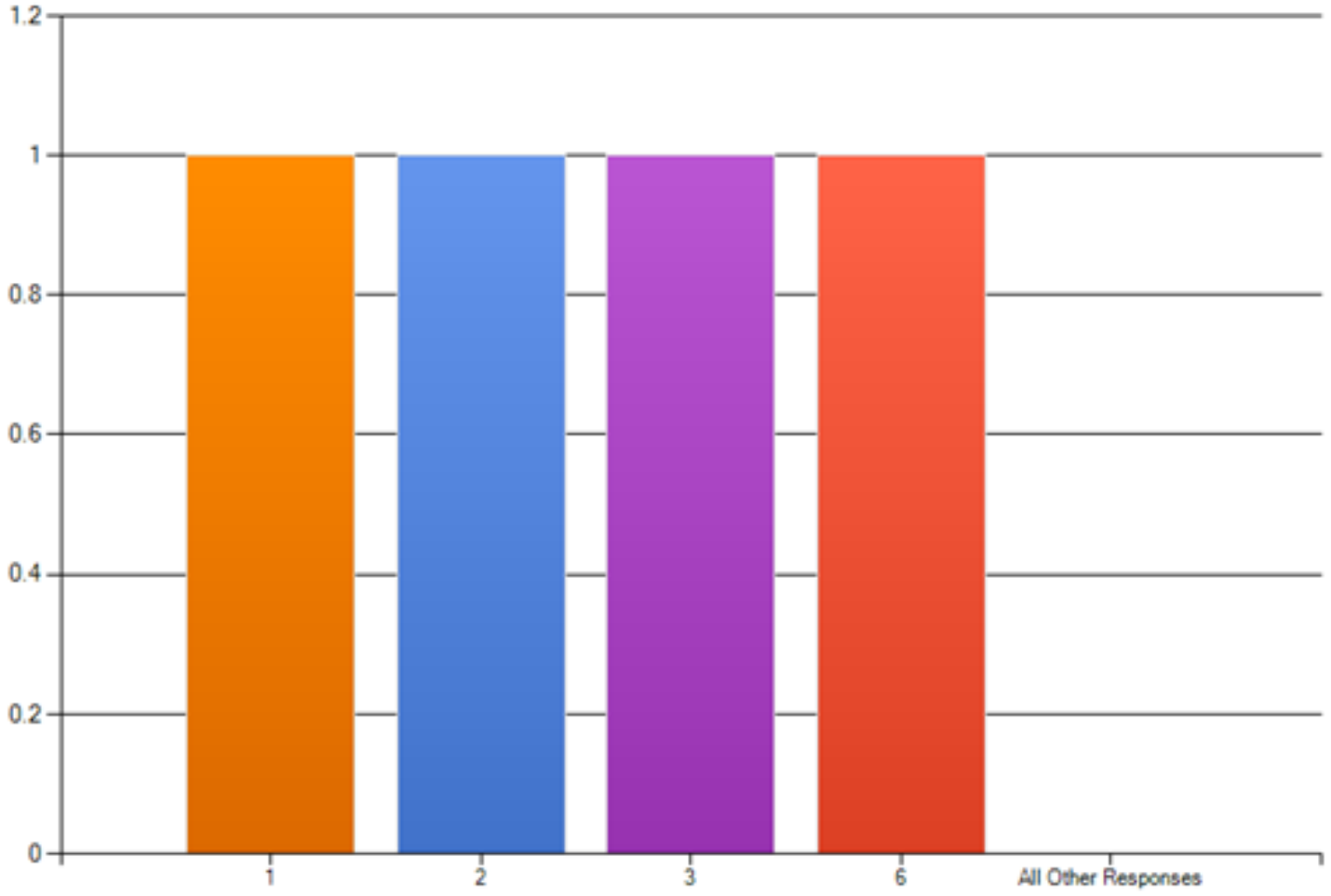
About how many Mountain Home Music concerts do you typically attend during a concert season?



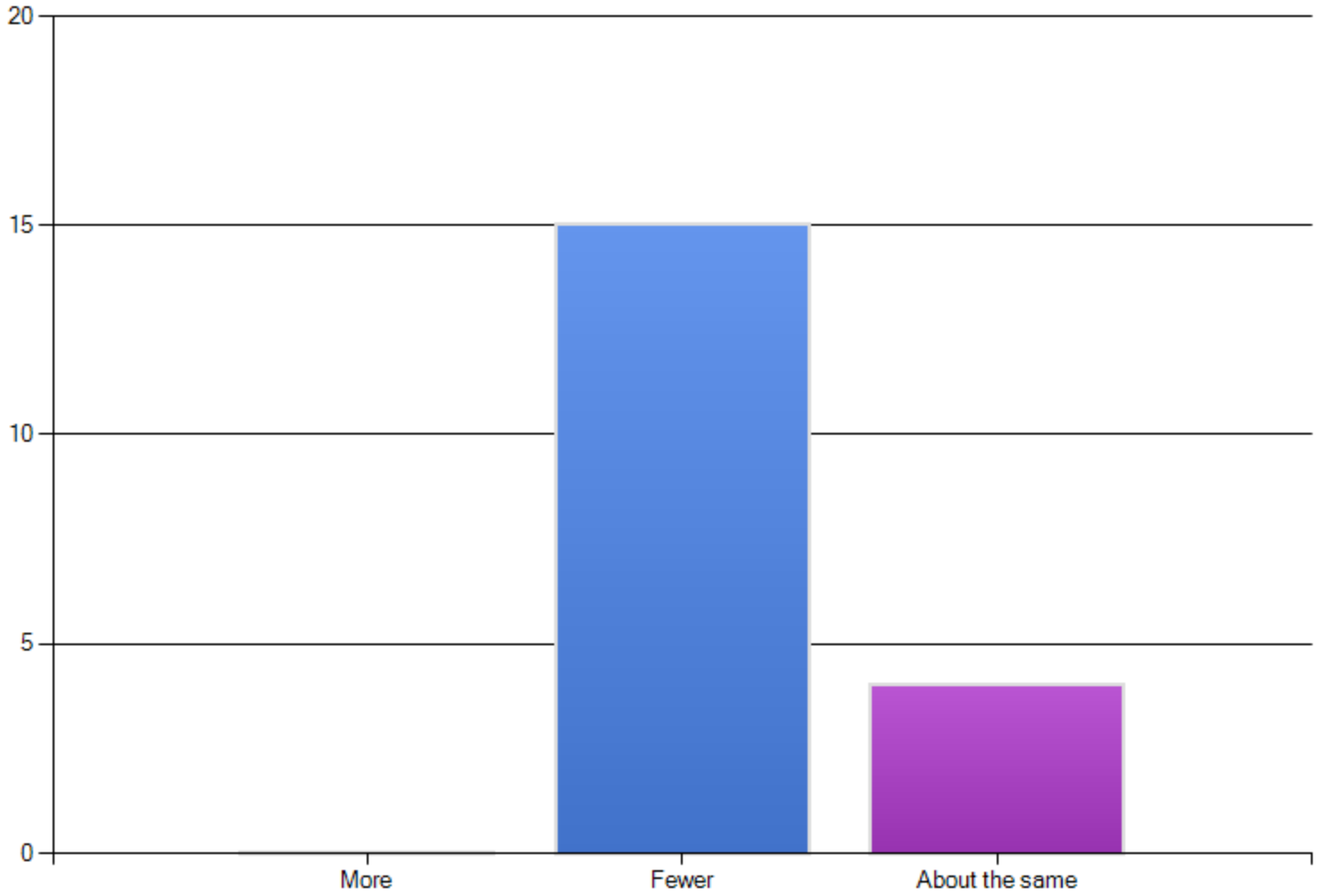
If the price of Mountain Home Music concert tickets increase by $3 for the 2011 season, do you think you would attend more, fewer, or about the same number of concerts next year?



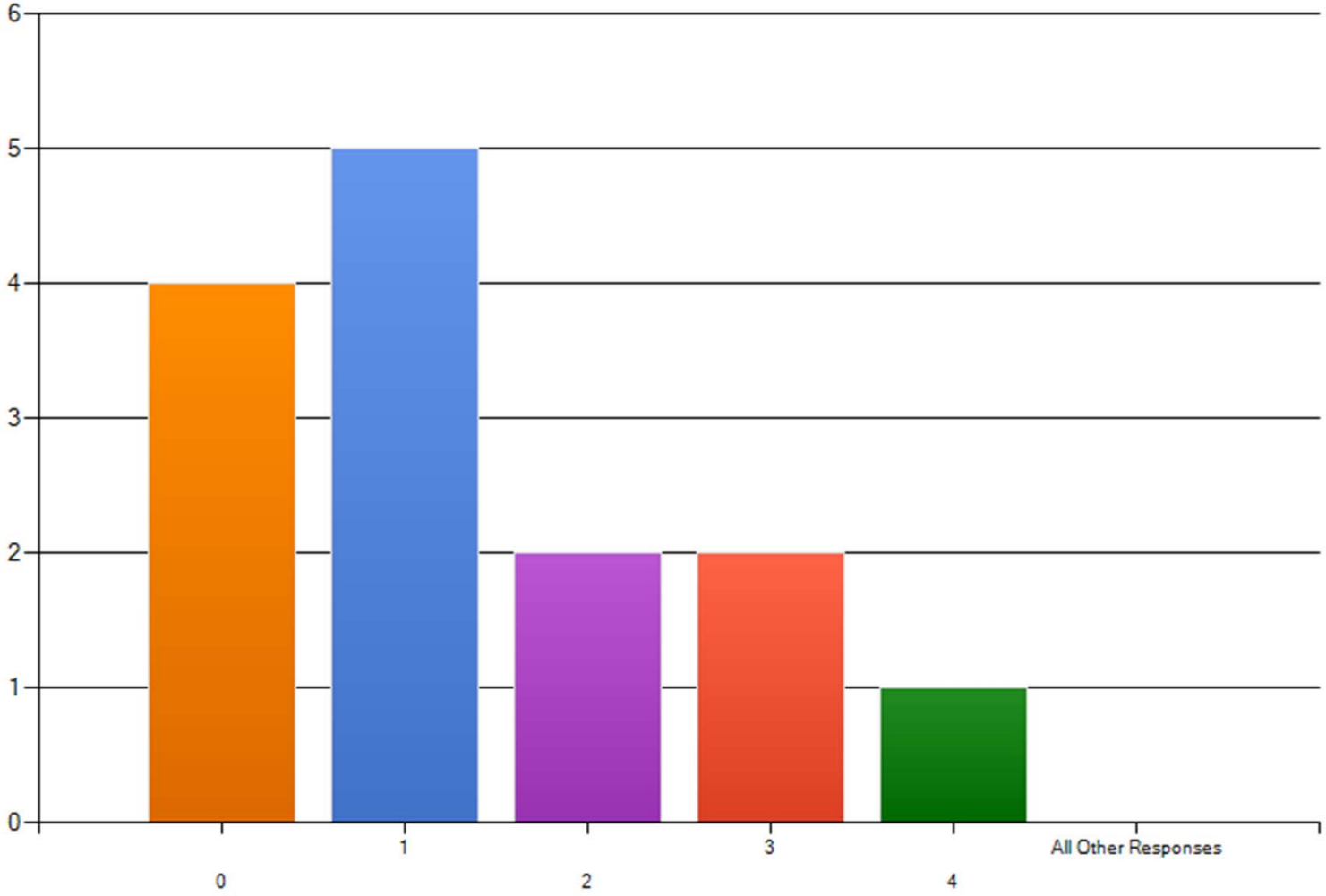
If the price increases by $3 per ticket, how many Mountain Home Music concerts do you think you would attend during the 2011 season?



If the price of Mountain Home Music concert tickets increase by $10 for the 2011 season, do you think you would attend more, fewer, or about the same number of concerts next year?



If the price increases by $10 per ticket, how many Mountain Home Music concerts do you think you would attend during the 2011 season?



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

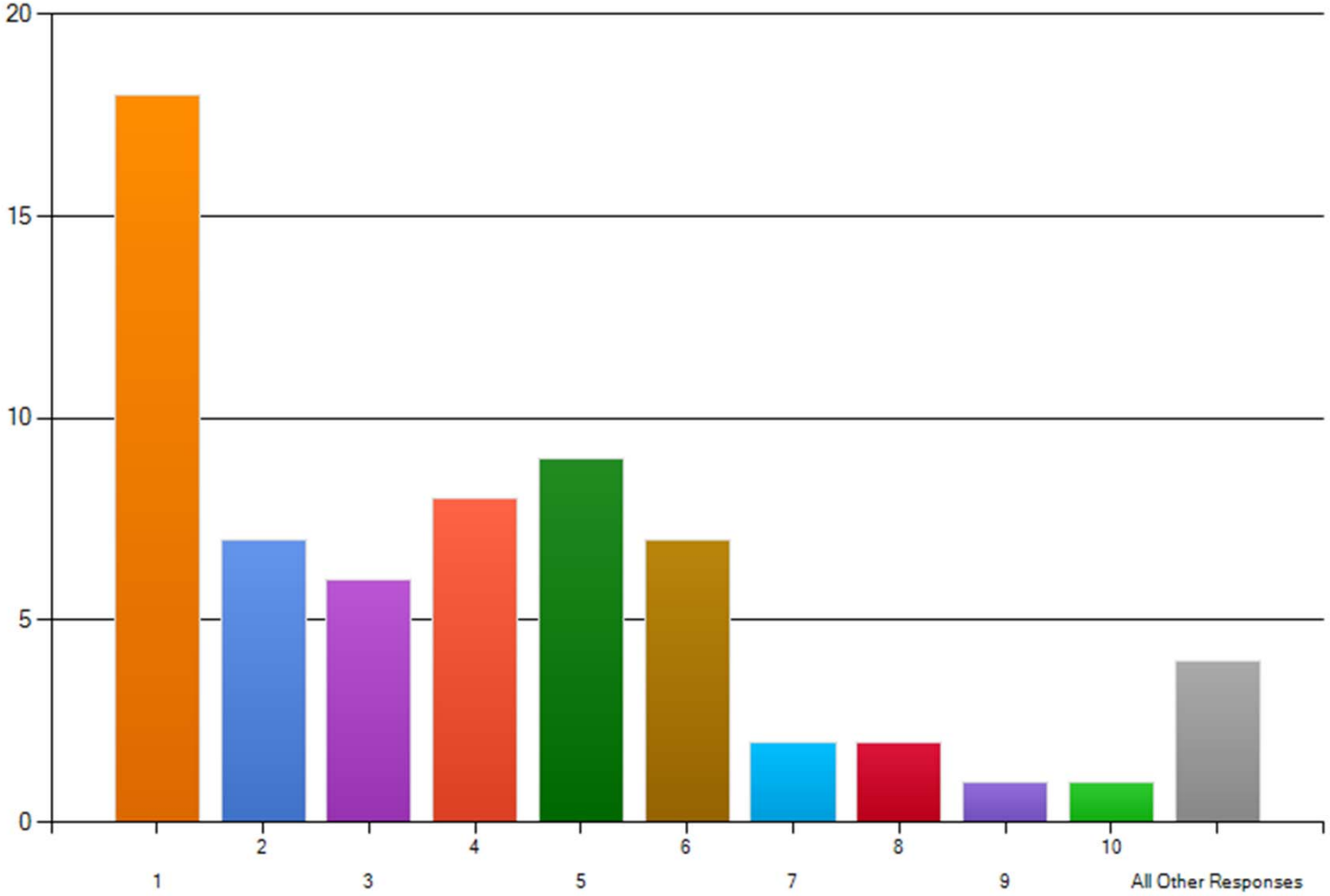
Total Count:	123
Unsent/New:	0
Sent:	123
Responded (Partial/Complete):	65 (2 / 63)
Unresponded:	58
Opted Out:	0
Bounced:	1

Messages

Edit Messages

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

About how many Mountain Home Music concerts did you attend during the 2010 concert season?



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

- $\Delta Q = Q_T^{rp} - \left(Q_t^{rp} + Q_t^{sp}\right)$
- 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
  - $\Delta Q \neq 0$; $s$igned 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	

Hypothetical Bias Test

- Dependent variable:
  - $HB = Q_t^{sp} - \Delta Q^{rp}$
- Independent variable:
  - SP
- Model:
  - $HB = \gamma + \delta SP$

Coefficient	Estimate
χ	-0.46
	(0.85)
δ	4.22*
	(1.19)
n = 38, R^2 = 0.26	

Predictive Validity Test

- Fixed effects model (Cameron and Englin, 1996)

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

- 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			

Conclusions

- Stated preference concert attendance lacks criterion validity.
- An ex-ante RP-SP model demonstrates predictive validity.
  - Survey respondents are accurate when predicting their own behavior after a statistical adjustment for hypothetical bias.

Potential Future Validity Tests

- Blood Sweat and Gears
- Rocky Knob Mountain Bike Park
- High Country Farm Tour
- BSG Training Ride
- High Country Local First
- 6 Hours of Warrior Creek