Online Appendix

Decision-Making under the Gambler's Fallacy: Evidence from Asylum Judges, Loan Officers, and Baseball Umpires

Daniel Chen
Toulouse Institute for Advanced Study
daniel.li.chen@gmail.com

Tobias J. Moskowitz
University of Chicago and NBER
tobias.moskowitz@chicagobooth.edu

Kelly Shue
University of Chicago and NBER
kelly.shue@chicagobooth.edu

January 12, 2016

*Corresponding author: Kelly Shue, University of Chicago and NBER, 5807 S Woodlawn Ave, Chicago, IL, 60601, (734) 834-0046, kelly.shue@chicagobooth.edu. We thank Dan Benjamin, John Campbell, Kent Daniel, Stefano Dellavigna, Andrea Frazzini, Radha Gopalan, Emir Kamenica, Adrien Matray, Sendhil Mullainathan, Josh Schwartzstein, Dick Thaler, Jeff Zwiebel, three anonymous referees, and Andrei Shleifer (the editor) for helpful comments and suggestions. We thank seminar participants at AEA, ANU, Conference on Behavioral and Experimental Economics, Conference on Empirical Legal Studies, Cornell, Cubist, Dartmouth, Econometric Society, Gerzensee ESSFM, Indiana University, ISNIE, McGill, NBER Behavioral Economics, Northeastern, Norwegian School of Economics, Red Rock Finance Conference, Rice, Rochester, SITE, Texas Finance Festival, University of Chicago, University of Oklahoma, University of Washington, UNSW, Yale Summer School in Behavioral Finance, and Zurich for helpful comments. We also thank Alex Bennett, Luca Braghieri, Leland Bybee, Sarah Eichmeyer, Chattrin Laksanabunsong, and Kaushik Vasudevan for excellent research assistance and Sue Long for helpful discussions about the asylum court data.

A Asylum Judges

Table A.I
Asylum Judges: Differences between Baseline Sample Cuts

This table re-estimates the baseline results presented in Table II, using interaction terms to test whether the differences between cumulative subsamples are statistically significant. All direct effects of dummies for moderate judge, same day case, and same defensive status are included and all control variables in Table II are interacted with these three dummies respectively in Columns 1, 2, and 3. All other sample restrictions and control variables are as described in Table II. Standard errors are clustered by judge. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Grant Asylum Dummy		
	(1)	(2)	(3)
Lag grant	0.00351	-0.00726	0.0168
	(0.00427)	(0.00578)	(0.0104)
Lag grant x moderate judge	-0.0143**		
	(0.00593)		
Lag deny x same day case		-0.00827	
		(0.00884)	
Lag grant x same defensive status			-0.0494***
			(0.0126)
Exclude extreme judges	No	Yes	Yes
Exclude different day cases	No	No	Yes
N	150,357	80,733	36,389
R^2	0.378	0.210	0.228

Table A.II
Asylum Judges: Logit and Probit Regressions

This table re-estimates the baseline results presented in Table II, using logit (Panel A) or probit (Panel B) regressions. All reported coefficients represent marginal effects. All other sample restrictions and control variables are as described in TableII. Standard errors are clustered by judge. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Logit Regressions

	Grant Asylum Dummy				
	(1)	(2)	(3)	(4)	(5)
Lag grant	-0.00485*	-0.0105***	-0.0151**	-0.0310***	
	(0.00265)	(0.00391)	(0.00592)	(0.00721)	
β_1: Lag grant - grant					-0.0514***
					(0.0138)
β_2: Lag deny - grant					-0.0341**
					(0.0154)
β_3: Lag grant - deny					-0.00800
					(0.0139)
p-value: $\beta_1 = \beta_2 = \beta_3$					0.0485
p-value: $\beta_1 = \beta_2$					0.293
p-value: $\beta_1 = \beta_3$					0.0220
p-value: $\beta_2 = \beta_3$					0.0485
Exclude extreme judges	No	Yes	Yes	Yes	Yes
Same day cases	No	No	Yes	Yes	Yes
Same defensive cases	No	No	No	Yes	Yes
N	150,246	80,659	36,313	23,894	10,587

Panel B: Probit Regressions

	Grant Asylum Dummy				
	(1)	(2)	(3)	(4)	(5)
Lag grant	-0.00453*	-0.0103***	-0.0147**	-0.0307***	
	(0.00268)	(0.00391)	(0.00597)	(0.00724)	
β_1: Lag grant - grant					-0.0513***
					(0.0137)
β_2: Lag deny - grant					-0.0342**
					(0.0155)
β_3: Lag grant - deny					-0.00908
					(0.0141)
p-value: $\beta_1 = \beta_2 = \beta_3$					0.0577
p-value: $\beta_1 = \beta_2$					0.297
p-value: $\beta_1 = \beta_3$					0.0257
p-value: $\beta_2 = \beta_3$					0.0571
Exclude extreme judges	No	Yes	Yes	Yes	Yes
Same day cases	No	No	Yes	Yes	Yes
Same defensive cases	No	No	No	Yes	Yes
N	150,246	80,659	36,313	23,894	10,587

Table A.III
Asylum Judges: Baseline Results with Judge Fixed Effects

This table re-estimates the baseline results presented in Table II, including judge fixed effects as control variables. All other sample restrictions and control variables are as described in Table II. Standard errors are clustered by judge. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Grant Asylum Dummy				
	(1)	(2)	(3)	(4)	(5)
Lag grant	-0.00664**	-0.0127***	-0.0153**	-0.0326***	
	(0.00308)	(0.00412)	(0.00626)	(0.00762)	
β_1: Lag grant - grant					-0.0571***
					(0.0147)
β_2: Lag deny - grant					-0.0400**
					(0.0171)
β_3: Lag grant - deny					-0.0106
					(0.0155)
p-value: $\beta_1 = \beta_2 = \beta_3$					0.0512
p-value: $\beta_1 = \beta_2$					0.324
p-value: $\beta_1 = \beta_3$					0.0240
p-value: $\beta_2 = \beta_3$					0.0428
Exclude extreme judges	No	Yes	Yes	Yes	Yes
Same day cases	No	No	Yes	Yes	Yes
Same defensive cases	No	No	No	Yes	Yes
N	150,357	80,733	36,389	23,990	10,652
R^2	0.379	0.215	0.237	0.247	0.299

Table A.IV
Asylum Judges: Baseline Results with Alternative Grant Definition

This table re-estimates the baseline results presented in Table II. In all other results relating to Asylum Judges, we defined the grant decision indicator as equal to 1 if the judge granted asylum. In this table we define grant as equal to 1 if the judge granted asylum, withholding of removal, or protection under the United States Convention Against Torture ("CAT"). All other sample restrictions and control variables are as described in Table II. Standard errors are clustered by judge. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Grant Asylum Dummy				
	(1)	(2)	(3)	(4)	(5)
Lag grant	-0.00555*	-0.00918**	-0.0120*	-0.0292***	
	(0.00317)	(0.00431)	(0.00676)	(0.00860)	
β_1: Lag grant - grant					-0.0492***
					(0.0158)
β_2: Lag deny - grant					-0.0277
					(0.0174)
β_3: Lag grant - deny					-0.000936
					(0.0154)
p-value: $\beta_1 = \beta_2 = \beta_3$					0.0445
p-value: $\beta_1 = \beta_2$					0.194
p-value: $\beta_1 = \beta_3$					0.0142
p-value: $\beta_2 = \beta_3$					0.0769
Exclude extreme judges	No	Yes	Yes	Yes	Yes
Same day cases	No	No	Yes	Yes	Yes
Same defensive cases	No	No	No	Yes	Yes
N	150,357	80,733	36,389	23,990	10,652
R^2	0.400	0.228	0.247	0.254	0.296

Table A.V
Asylum Judges: Bivariate Probit

This table re-estimates the baseline results presented in Table II using bivariate probit regressions. In all columns, the sample is limited to observations that follow another case on the same day with the same defensive status. Columns 1 and 2 restrict the sample to moderate judge observations (the average grant rate for the judge for the nationality-defensive category of the current case, calculated excluding the current observation, is between 0.2 and 0.8 in Column 1 or 0.3 and 0.7 in Column 2). Columns 3 and 4 restrict the sample to more extreme judge observations (the average grant rate for the judge for the nationality-defensive category of the current case, calculated excluding the current observation, is below 0.2 or above 0.8 in Column 3 or below 0.3 or above 0.7 in Column 4). All other control variables are as described in Table II. Standard errors are clustered by judge. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Moderates		Extremes	
	(1)	(2)	(3)	(4)
Lag grant	-0.0558***	-0.0853***	0.00100	-0.0159
	(0.0135)	(0.0192)	(0.0830)	(0.0147)
Grant rate	[0.2, 0.8]	[0.3, 0.7]	<0.2 or >0.8	<0.3 or >0.7
N	23,990	10,125	23,492	36,476

Table A.VI
Asylum Judges: Autocorrelation in Case Quality

This table tests whether lower quality cases tend to follow previous grant decisions. All regressions omit control variables relating to the characteristics of the current case (presence of lawyer representation indicator; family size; nationality x defensive fixed effects, and time of day fixed effects (morning / lunchtime / afternoon). We create a predicted quality measure by estimating a first stage regression of grant decisions on case characteristics: whether the applicant had a lawyer, number of family members, whether the case warranted a written decision, and nationality x defensive status fixed effects. We estimate this regression using the entire sample of decisions and create predicted grant status for each case using the estimated coefficients. *Quality Measure 1* is this predicted grant status, normalized by the mean predicted grant status within the court. *Quality Measure 2* is similar, except the first stage regression is estimated excluding all observations corresponding to the current judge. Columns 1 and 2 regress these predicted quality measures on the lagged grant decision. Column 3 explores whether *Lag grant* is associated with higher probability of the next case having a lawyer. Column 4 explores whether *Lag grant* is associated with higher probability of the next case having a higher quality lawyer. Lawyer quality equals the average grant rate among cases represented by that lawyer, calculated excluding the current case. Cases without legal representation are excluded from this sample. Column 5 explores whether *Lag grant* is associated with the next case corresponding to a larger families (larger family size is positively associated with grants). Standard errors are clustered by judge. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Quality Measure 1	Quality Measure 2	Lawyer Dummy	Lawyer Quality	Size of Family
	(1)	(2)	(3)	(4)	(5)
Lag grant	0.0157***	0.0164***	-0.000978	0.00226	-0.00517
	(0.00257)	(0.00273)	(0.00280)	(0.00287)	(0.0117)
N	23990	24003	24013	19749	24013
R^2	0.117	0.106	0.0162	0.364	0.00690

B Loan Officers

Table A.VII
Loan Officers: Consensus in Decision-Making

This table tests whether loan officers make decisions that correlated with the ex ante quality of each loan file. We make use of the fact that multiple loan officers review the same loan file and use the decisions of other loan officers (excluding the current loan officer) as our measure of the ex ante quality of each loan file. In Columns (1) and (2), we regress the current decision on the fraction of other loan officers who approved the current loan file. In Columns (3) and (4), regress the current decision on the mean quality score assigned by other loan officers for the current loan file. All other sample restrictions and control variables are as described in Table V. Standard errors are clustered by loan officer. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Approve Loan Dummy			
	(1)	(2)	(3)	(4)
fraction approved x flat incent	0.505***	0.479***		
	(0.0647)	(0.150)		
fraction approved x stronger incent	0.655***	0.683***		
	(0.0308)	(0.0574)		
fraction approved x strongest incent	0.789***	0.668***		
	(0.0628)	(0.100)		
mean quality score x flat incent			0.137***	0.152**
			(0.0273)	(0.0697)
mean quality score x stronger incent			0.212***	0.261***
			(0.0156)	(0.0289)
mean quality score x strongest incent			0.322***	0.221***
			(0.0381)	(0.0601)
p-value equality across incentives	0.00713	0.443	0.000404	0.331
Sample	All	Moderates	All	Moderates
N	9,145	3,126	9,145	3,126
R^2	0.0894	0.0815	0.0416	0.0422

Table A.VIII
Loan Officers: Logit and Probit Regressions

This table re-estimates the baseline results presented in Table V, using logit (Panel A) or probit (Panel B) regressions. All reported coefficients represent marginal effects. All other sample restrictions and control variables are as described in Table V. Standard errors are clustered by loan officer x incentive treatment. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Logit Regressions

	Approve Loan Dummy			
	(1)	(2)	(3)	(4)
Lag approve x flat incent	-0.108**	-0.0979**	-0.296***	-0.299***
	(0.0473)	(0.0472)	(0.105)	(0.103)
Lag approve x stronger incent	-0.00650	-0.00200	-0.0519**	-0.0481**
	(0.0129)	(0.0129)	(0.0214)	(0.0213)
Lag approve x strongest incent	0.00902	0.0148	-0.0516	-0.0463
	(0.0266)	(0.0260)	(0.0449)	(0.0432)
p-value equality across incentives	0.0873	0.105	0.0750	0.0587
Control for current loan quality	No	Yes	No	Yes
Sample	All	All	Moderates	Moderates
N	7,640	7,640	2,615	2,615

Panel B: Probit Regressions

	Approve Loan Dummy			
	(1)	(2)	(3)	(4)
Lag approve x flat incent	-0.0986**	-0.0873**	-0.269***	-0.274***
	(0.0432)	(0.0433)	(0.0930)	(0.0919)
Lag approve x stronger incent	-0.00614	-0.00120	-0.0521**	-0.0487**
	(0.0130)	(0.0130)	(0.0214)	(0.0213)
Lag approve x strongest incent	0.00975	0.0150	-0.0526	-0.0489
	(0.0271)	(0.0266)	(0.0451)	(0.0437)
p-value equality across incentives	0.0896	0.119	0.0747	0.0567
Control for current loan quality	No	Yes	No	Yes
Sample	All	All	Moderates	Moderates
N	7,640	7,640	2,615	2,615

Table A.IX
Loan Officers: Baseline Results with Loan Officer Fixed Effects

This table re-estimates the baseline results presented in Table V, including loan officer fixed effects as control variables. All other sample restrictions and control variables are as described in Table V. Standard errors are clustered by loan officer x incentive treatment. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Approve Loan Dummy			
	(1)	(2)	(3)	(4)
Lag approve x flat incent	-0.0908***	-0.0800**	-0.221***	-0.225***
	(0.0317)	(0.0318)	(0.0597)	(0.0575)
Lag approve x stronger incent	-0.0313**	-0.0267**	-0.0868***	-0.0827***
	(0.0133)	(0.0133)	(0.0212)	(0.0211)
Lag approve x strongest incent	-0.00709	-0.000900	-0.0812*	-0.0735*
	(0.0293)	(0.0287)	(0.0451)	(0.0434)
p-value equality across incentives	0.127	0.164	0.0941	0.0559
Control for current loan quality	No	Yes	No	Yes
Sample	All	All	Moderates	Moderates
N	7,640	7,640	2,615	2,615
R^2	0.0509	0.0781	0.0599	0.0890

Table A.X

Loan Officers: Bivariate Probit Regressions

This table re-estimates the baseline results presented in Table V using bivariate probit regressions. Because bivariate probit analysis does not extend to interactions terms involving incentive type, each coefficient represents the results from a separate regression. For example, the top number in Column (1) represents the the residual correlation between the approve loan dummy and the lag approve dummy within the flat incent sample. An observation is considered moderate if the loan officer's average approval rate for loans, excluding the current session, is between 0.3 and 0.7 inclusive, and extreme otherwise. All other sample restrictions and control variables are as described in Table V. Standard errors are clustered by loan officer. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Moderates		Extremes	
	(1)	(2)	(3)	(4)
Lag approve x flat incent	-0.383***	-0.393***	-0.0809	-0.0432
	(0.118)	(0.117)	(0.0803)	(0.0842)
Lag approve x stronger incent	-0.0879**	-0.0842**	0.0358	0.0474
	(0.0358)	(0.0364)	(0.0309)	(0.0316)
Lag approve x strongest incent	-0.0890	-0.0838	0.0730	0.0867
	(0.0762)	(0.0778)	(0.0642)	(0.0653)
Control for current loan quality	No	Yes	No	Yes
N total	2,615	2,615	5,025	5,025

Table A.XI
Loan Officers: Robustness to Balanced Session Design

This table tests whether our results are robust to a balanced session design (each session consisted of 4 performing loans and 2 non-performing loans, randomly ordered). In Columns 1 and 2, we reproduce the results from Columns 1 and 3 of Table V showing that the negative autocorrelation in decisions is strongest under the flat incentive scheme. In Columns 3 and 4, we regress an indicator for the true quality of the current loan on the indicator for the lagged decision made by the loan officer. In Columns 5 and 6, we regress an indicator for the true quality of the current loan on the indicator for the true quality of the previous loan file. Indicator variables for flat incent, strong incent, and strongest incent are also included. All other variables are as described in Table V. Standard errors are clustered by loan officer x incentive treatment. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Approve Loan Dummy		Performing Loan Dummy			
	(1)	(2)	(3)	(4)	(5)	(6)
Lag approve x flat incent	-0.0814**	-0.225***	-0.0623*	0.0238		
	(0.0322)	(0.0646)	(0.0337)	(0.0638)		
Lag approve x stronger incent	-0.00674	-0.0525**	-0.0269*	-0.0227		
	(0.0134)	(0.0215)	(0.0148)	(0.0242)		
Lag approve x strongest incent	0.0102	-0.0530	-0.0378	-0.0334		
	(0.0298)	(0.0468)	(0.0295)	(0.0465)		
Lag perform x flat incent					-0.191***	-0.155***
					(0.0262)	(0.0529)
Lag perform x stronger incent					-0.131***	-0.142***
					(0.0123)	(0.0198)
Lag perform x strongest incent					-0.195***	-0.231***
					(0.0255)	(0.0407)
p-value equality across incentives	0.0695	0.0395	0.622	0.753	0.0192	0.147
Sample	All	Moderates	All	Moderates	All	Moderates
N	7,640	2,615	7,640	2,615	7,640	2,615
R^2	0.0257	0.0247	0.00117	0.00102	0.0235	0.0267

C Baseball Umpires

Table A.XII
Baseball Umpires: Umpire, Batter, and Pitcher Fixed Effects

This table re-estimates the baseline results presented in Columns 3 and 4 of Table IX, with the addition of umpire, batter, or pitcher fixed effects. All other sample restrictions and control variables are as described in Table IX. Standard errors are clustered by game. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Strike	Umpire FE		Batter FE		Pitcher FE	
	(1)	(2)	(3)	(4)	(5)	(6)
Lag strike	-0.0148***		-0.0153***		-0.0153***	
	(0.000972)		(0.000973)		(0.000971)	
β_1: Lag strike - strike		-0.0215***		-0.0224***		-0.0240***
		(0.00269)		(0.00269)		(0.00269)
β_2: Lag ball - strike		-0.0190***		-0.0197***		-0.0197***
		(0.00156)		(0.00157)		(0.00157)
β_3: Lag strike - ball		-0.00715***		-0.00711***		-0.00793***
		(0.00155)		(0.00155)		(0.00155)
p-value: $\beta_1 = \beta_2 = \beta_3$		9.15e-22		4.12e-24		1.91e-22
p-value: $\beta_1 = \beta_2$		0.304		0.260		0.0812
p-value: $\beta_1 = \beta_3$		1.34e-08		1.56e-09		2.33e-10
p-value: $\beta_2 = \beta_3$		5.01e-21		3.86e-23		1.20e-20
Pitch location	Yes	Yes	Yes	Yes	Yes	Yes
Pitch trajectory	Yes	Yes	Yes	Yes	Yes	Yes
Game conditions	Yes	Yes	Yes	Yes	Yes	Yes
N	898,741	428,005	898,741	428,005	898,741	428,005
R^2	0.665	0.670	0.666	0.671	0.667	0.672

Table A.XIII
Baseball Umpires: Controlling for the Moving Average of Past Decisions

This table re-estimates the baseline results presented in Table IX. We include the fraction of the past five umpire calls (excluding the current call) within the same game that were called as a strike as an additional control variable. All other sample restrictions and control variables are as described in Table IX. Standard errors are clustered by game. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Strike	Full Sample		Consecutive Pitches	
	(1)	(2)	(3)	(4)
Lag strike	-0.00932***		-0.0146***	
	(0.000612)		(0.000990)	
β_1: Lag strike - strike		-0.0145***		-0.0217***
		(0.00115)		(0.00280)
β_2: Lag ball - strike		-0.0107***		-0.0191***
		(0.000759)		(0.00161)
β_3: Lag strike - ball		-0.00351***		-0.00734***
		(0.000687)		(0.00159)
p-value: $\beta_1 = \beta_2 = \beta_3$		2.36e-31		6.24e-21
p-value: $\beta_1 = \beta_2$		0.0000851		0.297
p-value: $\beta_1 = \beta_3$		3.44e-25		2.94e-08
p-value: $\beta_2 = \beta_3$		3.23e-23		3.37e-20
Pitch location	Yes	Yes	Yes	Yes
Pitch trajectory	Yes	Yes	Yes	Yes
Game conditions	Yes	Yes	Yes	Yes
N	1,503,360	1,307,582	873,878	418,842
R^2	0.669	0.668	0.665	0.669

Table A.XIV
Baseball Umpires: Logit and Probit Regressions

This table re-estimates the baseline results presented in Columns 3 and 4 of Table IX, using logit or probit regressions. All reported coefficients represent marginal effects. All other sample restrictions and control variables are as described in Table IX. Standard errors are clustered by game. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Strike	Logit		Probit	
	(1)	(2)	(3)	(4)
Lag strike	-0.0164***		-0.0168***	
	(0.00110)		(0.00109)	
β_1: Lag strike - strike		-0.0258***		-0.0266***
		(0.00359)		(0.00358)
β_2: Lag ball - strike		-0.0208***		-0.0215***
		(0.00175)		(0.00174)
β_3: Lag strike - ball		-0.00674***		-0.00716***
		(0.00174)		(0.00173)
p-value: $\beta_1 = \beta_2 = \beta_3$		1.24e-21		1.10e-22
p-value: $\beta_1 = \beta_2$		0.143		0.141
p-value: $\beta_1 = \beta_3$		6.06e-08		3.29e-08
p-value: $\beta_2 = \beta_3$		7.12e-21		7.67e-22
Pitch location	Yes	Yes	Yes	Yes
Pitch trajectory	Yes	Yes	Yes	Yes
Game conditions	Yes	Yes	Yes	Yes
N	806,525	364,841	806,525	364,841

Table A.XV
Baseball Umpires: Bivariate Probit Regressions

This table re-estimates the baseline results presented in Columns 1 and 3 of Table IX using bivariate probit regressions. Because of the large sample size, we remove all control variables other than the true strike status (what the correct call should have been) to allow the bivariate estimator to converge. All other sample restrictions are as described in Table IX. Standard errors are clustered by game. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Strike	Full Sample	Consecutive Pitches
	(1)	(2)
Lag strike	-0.148***	-0.213***
	(0.00167)	(0.00210)
N	1,536,807	898,741

Table A.XVI
Baseball Umpires: Excluding Controls for the Count

This table re-estimates the baseline results presented in Columns 3 and 4 of Table IX without including dummy variables for all possible count combinations (# balls and strikes called so far). The count is correlated with the recent set of lagged calls, so one may be concerned whether our baseline results are influenced by issues related to over-controlling. All other sample restrictions and control variables are as described in Table IX. Standard errors are clustered by game. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Strike	Exclude Count Controls	
	(1)	(2)
Lag strike	-0.0374***	
	(0.000737)	
β_1: Lag strike - strike		-0.0514***
		(0.00181)
β_2: Lag ball - strike		-0.0485***
		(0.00123)
β_3: Lag strike - ball		-0.0350***
		(0.00119)
p-value: $\beta_1 = \beta_2 = \beta_3$		1.40e-34
p-value: $\beta_1 = \beta_2$		0.0683
p-value: $\beta_1 = \beta_3$		4.27e-23
p-value: $\beta_2 = \beta_3$		1.51e-27
Pitch location	Yes	Yes
Pitch trajectory	Yes	Yes
Game conditions	Yes	Yes
N	898,741	428,005
R^2	0.663	0.668

Table A.XVII
Baseball Umpires: Endogenous Pitcher Response

This table tests whether the location of the pitch relative to the strike zone is related to the decision to call the previous pitch(es) as strike. The sample is restricted to consecutive called pitches because that is the same baseline sample we use to estimate negative autocorrelation in umpire decisions. The specifications are similar to those in Table IX, except that the dependent variable is replaced with a measure of pitch location. Columns 1 and 2 use an indicator for whether the current pitch was within the strike zone as the dependent variable. Columns 3-6 use the distance of the pitch in inches from the center of the strike zone as the dependent variable. Columns 1-4 exclude the following location control variables: pitch location (indicators for each 3x3 inch square) and an indicator for whether the current pitch was within the strike zone. Columns 5 and 6 use the full set of control variables, including location indicator variables, as described in Table IX. The purpose of Columns 5 and 6 is to test whether the set of location controls (dummies for each 3 x 3 inch square) account for variation in pitch location. All reported coefficients on lagged calls become small and insignificantly different from zero, indicating that the controls effectively remove any autocorrelation in the quality of pitches and account for pitcher's endogenous responses to previous calls. Standard errors are clustered by game. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	True Strike		Distance from Center			
	(1)	(2)	(3)	(4)	(5)	(6)
Lag strike	0.0168***		-0.275***		-0.00408	
	(0.00149)		(0.0236)		(0.00574)	
β_1: Lag strike - strike		0.0121***		-0.156**		-0.00358
		(0.00415)		(0.0701)		(0.0168)
β_2: Lag ball - strike		0.0200***		-0.361***		0.00662
		(0.00243)		(0.0367)		(0.00876)
β_3: Lag strike - ball		0.00308		-0.131***		0.00722
		(0.00241)		(0.0359)		(0.00855)
p-value: $\beta_1 = \beta_2 = \beta_3$		1.58e-17		2.03e-14		0.798
p-value: $\beta_1 = \beta_2$		0.0397		0.00194		0.518
p-value: $\beta_1 = \beta_3$		0.0211		0.708		0.509
p-value: $\beta_2 = \beta_3$		1.49e-18		1.10e-14		0.933
Pitch location	No	No	No	No	Yes	Yes
Pitch trajectory	Yes	Yes	Yes	Yes	Yes	Yes
Game conditions	Yes	Yes	Yes	Yes	Yes	Yes
N	898,741	428,005	898,741	428,005	898,741	428,005
R^2	0.0798	0.0924	0.171	0.188	0.952	0.952

D Continuous Quality Measures

Table A.XVIII
Asylum Judges: Sequential Contrast Effects?

This table tests whether the negative correlation between current asylum grant and lagged asylum grant could be caused by sequential contrast effects. *Lag Case Quality* is the standardized continuous measure of the predicted quality of the most recently reviewed asylum case. We create a predicted quality measure by estimating a first stage regression of grant decisions on case characteristics: whether the applicant had a lawyer, number of family members, whether the case warranted a written decision, and nationality x defensive status fixed effects. We estimate this regression using the entire sample of decisions (Column 1) or all observations except those associated with the current judge (Column 2) and create predicted grant status for each lagged case using the estimated coefficients and the lagged cases's observable characteristics. *Lag Grant* is a binary measure of whether the previous asylum was granted. Conditional on the binary measure of whether the previous asylum was granted, sequential contrast effects predict that the judge should be less likely to grant asylum to the current applicant if the previous case was of higher quality, measured continuously. In other words, sequential contrast effects predicts that the coefficient on *Lag Grant Quality* should be negative. Standard errors are clustered by judge. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Grant Asylum Dummy	
	(1)	(2)
Lag grant	-0.0356***	-0.0352***
	(0.00788)	(0.00785)
Lag case quality	0.00691*	0.00520
	(0.00385)	(0.00360)
p-value lag case quality < 0	0.0367	0.0751
Quality Measure	1	2
N	23,981	23,973
R^2	0.228	0.228

Table A.XIX
Loan Officers: Sequential Contrast Effects?

This table tests whether the negative correlation between current loan approval and lagged loan approval could be caused by sequential contrast effects. *Lag Loan Quality Rating* is a continuous measure of the quality of the most recently reviewed loan file while *Lagged Approve* is a binary measure of whether the previous loan was approved. Conditional on the binary measure of whether the previous loan was approved, sequential contrast effects predict that the loan officer should be less likely to approve the current loan if the previous loan was of higher quality, measured continuously. In other words, sequential contrast effects predicts that the coefficient on *Lag Loan Quality Rating* should be negative. The loan quality measure is rescaled to vary from 0 to 1. All other variables are as described in Table V . Standard errors are clustered by loan officer x incentive treatment. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Approve Loan Dummy	
	(1)	(2)
Lag approve	-0.0223	-0.0736***
	(0.0148)	(0.0264)
Lag loan quality rating	0.00679	0.00692
	(0.00994)	(0.0201)
p-value lag loan quality rating < 0	0.247	0.365
Sample	All	Moderates
N	7,495	2,615
R^2	0.0252	0.0225