Online Companion for

Do Incentive Hierarchies Induce User Effort? Evidence from an Online Knowledge Exchange

Appendix A. What happens when we do not consider "Incoming Points"?

When calculating the distance of goals in our main analysis, we argue that users take into account not only the actual number of points that they had earned, but also the "expected" number of points (incoming points) for questions that they had answered in the previous periods.

We now consider an alternative measurement of the distance from goals. If users are motivated only by the actual number of points that they have been rewarded, but not the incoming points, then we should observe similar results as reported in our main analysis, i.e. users should increase their efforts all the way up until they reach their goals. This did not turn out to be the case. Specifically, we apply a modified distance metric (based on actual total points only, excluding incoming points) to the first level goal, and report the results in Table A1 and Figure A1.[1]

[Insert Table A1 about here]
[Insert Figure A1 about here]

We can see from Figure A1 that under this "naïve" distance metric, users increase their efforts only up until a certain distance *below* the threshold of the first goal. They start reducing their efforts even before the goal is reached. The most plausible explanation for this observation is that users actually can "learn" from their past performance and reach an "expectation" of the number of points that they could earn from questions that they answered previously, even though those questions are still open and the askers had not accepted a solution. In other words, these results suggest that incoming points—points associated with questions that users had exerted effort on, but had not been rewarded by askers—should indeed be included in the consideration of distance from goals.

[1] Results are qualitatively similar for the second-level goal, though the curvature is less prominent due to fewer observations.

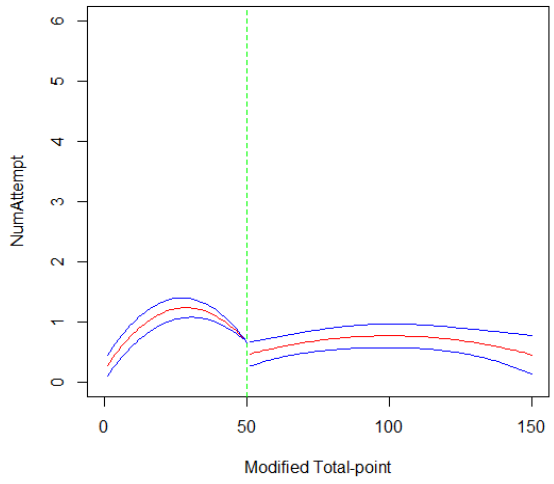
Table and Figure for Appendix A

Table A1 Estimation of Panel Data Model with Original Distance (First Level Goal)

Distance Fun.	None	Linear	Quadratic	Cubic
$FirstGoal_{it}$		-.8878***	-.2021+	-1.2476***
		(.0734)	(.1046)	(.1359)
BeforeFirst		.0226***	-.0541***	.0844***
		(.0014)	(.0057)	(.0151)
$BeforeFirst^2$			-.0013***	.0046***
			(9.10e-5)	(.0006)
$BeforeFirst^3$				.0007***
				(6.90e-6)
AfterFirst		.0014***	.0126**	.0708***
		(.0013)	(.0043)	(.0099)
$AfterFirst^2$			-.0001**	-.0018***
			(4.68e-5)	(.0003)
$AfterFirst^3$				.0001***
				(1.84e-6)
$LogAskCount_{it}$	1.6613***	1.6542***	1.6473***	1.6465***
	(.0352)	(.0352)	(.0352)	(.0351)
$LogTenure_{it}$	-.4113***	-.4490***	-.4704***	-.4857***
	(.0145)	(.0148)	(.0149)	(.0150)
AIC	409790.1	409533.6	409337.5	409194.5
BIC	410398.9	410170.9	409993.8	409869.8

We run fixed effects models on $NumAttempt_{it}$. The number of observations is 99895, and the number of individuals is 994. Calendar month dummies are included, but their coefficients are not reported.
***significant at 0.001, **significant at 0.01, *significant at 0.05, +significant at 0.1

Figure A1 Conditional Mean Function: Main Effect



Appendix B. Alternative Independent Variable: Time Distance Metric

Table A2 Estimation of Panel Data Model (First Level Goal)

Distance Fun.	None	Linear	Quadratic	Cubic
$FirstGoal_{it}$		-1.5469***	-2.7224***	-3.9635***
		(.1337)	(.1601)	(.1886)
BeforeFirst		.0443	.0967***	.1969***
		(.0295)	(.0294)	(.0297)
$BeforeFirst^2$			.0003***	.0017***
			(1.82e-5)	(8.85e-5)
$BeforeFirst^3$				4.73e-5***
				(2.91e-7)
AfterFirst		-.0245***	-.0797***	-.1900***
		(.0017)	(.0043)	(.0085)
$AfterFirst^2$			-.0003***	-.0017***
			(1.91e-5)	(9.19e-5)
$AfterFirst^3$				-4.78e-6***
				(2.96e-6)
$LogAskCount_{it}$	3.4516***	3.40223***	3.2452***	3.0721***
	(.2218)	(.2194)	(.2176)	(.2159)
$LogTenure_{it}$	-1.1243***	-1.1428***	-1.0873***	-.9995***
	(.0832)	(.0858)	(.0853)	(.0847)
AIC	84137.9	83810.9	83543.9	83282.5
BIC	84622.9	84318.6	84066.8	83820.5

We run fixed effects models on $NumAttempt_{it}$. The number of observations is 14433, and the number of individuals is 129. Calendar month dummies are included, but their coefficients are not reported.
***significant at 0.001, **significant at 0.01, *significant at 0.05, +significant at 0.1

Appendix C. Alternative DVs: Number of Points Attempted and Number of Questions Solved

Table A3 Estimation of Panel Data Model (Number of Points Attempted)

Distance Fun.	None	Linear	Quadratic	Cubic
$FirstGoal_{it}$		-.8125***	-.8643***	-1.1122***
		(.0309)	(.0411)	(.0480)
BeforeFirst		.0166***	.0236***	.1095***
		(.0006)	(.0019)	(.0032)
$BeforeFirst^2$			.0001***	.0049***
			(3.25e-5)	(.0001)
$BeforeFirst^3$				6.88e-5***
				(1.85e-6)
AfterFirst		.0096***	.0092***	.0309***
		(.0005)	(.0017)	(.0034)
$AfterFirst^2$			4.10e-6	-.0005***
			(1.61e-5)	(7.00e-5)
$AfterFirst^3$				2.86e-6***
				(4.04e-7)
$LogAskCount_{it}$	.7310***	.7177***	.7184***	.7146***
	(.0153)	(.0152)	(.0152)	(.0151)
$LogTenure_{it}$	-.1678***	-.2020***	-.1993***	-.2149***
	(.0063)	(.0064)	(.0064)	(.0064)
AIC	242967.4	241776.4	241765.9	240591.2
BIC	243576.1	242413.7	242422.2	241266.5

We run fixed effects models on $PointAttempt_{it}$. The number of observations is 99895, and the number of individuals is 994. Calendar month dummies are included, but their coefficients are not reported.
***significant at 0.001, **significant at 0.01, *significant at 0.05, +significant at 0.1

Table A4 Estimation of Panel Data Model (Number of Questions Solved)

Distance Fun.	None	Linear	Quadratic	Cubic
$FirstGoal_{it}$		-.9764***	-1.1415***	-1.3673***
		(.0437)	(.0582)	(.0680)
BeforeFirst		.0208***	.0341***	.1502***
		(.0008)	(.0027)	(.0045)
$BeforeFirst^2$			.0002***	.0067***
			(4.59e-5)	(.0002)
$BeforeFirst^3$				8.37e-5***
				(2.62e-6)
AfterFirst		.0101***	.0141***	.0304***
		(.0008)	(.0024)	(.0049)
$AfterFirst^2$			-3.92e-5+	-.0004***
			(2.28e-5)	(9.90e-5)
$AfterFirst^3$				2.12e-6***
				(5.72e-7)
$LogAskCount_{it}$	.2958***	.2803***	.2820***	.2773***
	(.0216)	(.0215)	(.0215)	(.0214)
$LogTenure_{it}$	-.2275***	-.2682***	-.2631***	-.2840***
	(.0089)	(.0090)	(.0091)	(.0090)
AIC	311886.7	311029.4	311003.9	309966.1
BIC	312495.5	311666.7	311660.2	310641.5

We run fixed effects models on $NumSolved_{it}$. The number of observations is 99895, and the number of individuals is 994. Calendar month dummies are included, but their coefficients are not reported.
***significant at 0.001, **significant at 0.01, *significant at 0.05, +significant at 0.1