Online Appendix

Appendix E Cognitive Hierarchy (CH) Model Predictions

In this section, we develop the CH model and its predictions. We compare these predictions with those from the level-k model to show that (a) the CH model does not predict new behaviors for senders than the level-k model; (b) the CH model does not predict qualitatively new behaviors for receivers than the level-k model, and the difference in predicted behaviors is not empirically distinguishable; (c) the CH model predicts a narrower range of possible behaviors across types than the level-k model.

The CH model assumes that an Lk player believes that other player(s) could be of any type from $L0$ through $L(k-1)$, with the probability of a particular type following a truncated Poisson distribution over these types and the mean τ of the (non-truncated) Poisson distribution being the same for all $k > 0$. Since the predictions of the CH model will depend on τ, where necessary, we describe the results for specific values of τ in the range $[0.25, 5]$. Past empirical applications of the CH model across a wide variety of games show that τ is typically between 1 and 2.

We start by specifying the $L0$ type behaviors. As in the level-k model, the $L0$ sender is truthful, reporting $\hat{\xi}_0(\xi) = \xi$, and the $L0$ receiver is credulous, taking action $a_0\left(\hat{\xi}\right) = a_I\left(\hat{\xi}\right)$. An Lk sender believes that the receiver could be of any type from $L0$ through $L(k-1)$, following a truncated Poisson distribution over types $t \in \{0, 1 \ldots k-1\}$ with non-truncated mean τ. An Lk receiver believes that the sender could be of any type from $L0$ through Lk, following a truncated Poisson distribution over types $t \in \{0, 1 \ldots k\}$ with non-truncated mean τ. Let $p_t(\tau) = \frac{e^{-\tau}\tau^t}{t!}$ denote the Poisson distribution probability for outcome $t \in \{0, 1, 2 \ldots\}$.

The Lk receiver also updates his belief about the sender's type in a Bayesian manner based on the sender's message, correctly anticipating the strategies of sender types $L0$ through Lk. Let $f_t\left(\hat{\xi}\right)$ denote the probability that a type t sender sends the message $\hat{\xi}$ (for some ξ), and $e_t\left(\hat{\xi}\right)$ denote the expected value of ξ conditional on the message $\hat{\xi}$ from a type t sender. Then, the Lk receiver's expected value of ξ conditional on the message $\hat{\xi}$ is

$$E^k\left[\xi \mid \hat{\xi}\right] = \frac{\sum_{t=0}^{k} e_t\left(\hat{\xi}\right) f_t\left(\hat{\xi}\right) p_t(\tau)}{\sum_{t=0}^{k} f_t\left(\hat{\xi}\right) p_t(\tau)}. \tag{25}$$

Therefore, the Lk receiver's expected payoff from action a is

$$\Pi_{Rk}\left(a;\hat{\xi}\right)=rE^{k}\left[\xi\mid\hat{\xi}\right]a-\frac{1}{2}ca^{2}. \tag{26}$$

Therefore, his optimal action

$$a_{k}\left(\hat{\xi}\right)=\frac{r}{c}E^{k}\left[\xi\mid\hat{\xi}\right]. \tag{27}$$

Next, consider the Lk sender. She correctly anticipates the response $a_t\left(\hat{\xi}\right)$ of receiver types $t\in\{0,1\ldots k-1\}$. Let $E^k\left[a_t\left(\hat{\xi}\right)\right]$ be the expected receiver action, given by

$$E^{k}\left[a_{t}\left(\hat{\xi}\right)\right]=\frac{\sum_{t=0}^{k}a_{k}\left(\hat{\xi}\right)p_{t}\left(\tau\right)}{\sum_{t=0}^{k}p_{t}\left(\tau\right)}. \tag{28}$$

Then, the Lk sender's expected payoff from message $\hat{\xi}$ is

$$\Pi_{Sk}=s\xi E^{k}\left[a_{t}\left(\hat{\xi}\right)\right]. \tag{29}$$

Therefore, the sender's optimal message is

$$\hat{\xi}_{k}\left(\xi\right)\in\arg\max_{\hat{\xi}}E^{k}\left[a_{t}\left(\hat{\xi}\right)\right]. \tag{30}$$

We now derive the predicted behaviors for each type iteratively and compare these predictions with those from the level-k model. We start with an $L1$ sender. The $L1$ sender believes the receiver is type $L0$ and hence sends the message $\hat{\xi}_1(\xi)=\bar{\xi}=80$, which is the same as in the level-k model.

Next, consider an $L1$ receiver. He believes that the sender could be of type $L1$ or $L0$, assigning a probability $\frac{p_0}{p_0+p_1}$ to type $L0$. Further, the $L1$ receiver updates her belief based on the sender's message $\hat{\xi}$. Because the $L0$ sender type truthfully sends message in the range$[10,80]$, all messages are equally probable, and the probability of receiving a message $\hat{\xi}$ from an $L0$ sender is $f_0\left(\hat{\xi}\right)=\frac{1}{71}$. Furthermore, the expected value of ξ given $\hat{\xi}$ (from an $L0$ sender) is $e_0\left(\hat{\xi}\right)=\hat{\xi}$. Because the $L1$ sender type always sends the message 80, $f_1\left(\hat{\xi}\right)=0$ for $\hat{\xi}\leq 79$ and $f_1(80)=1$. Further, the expected value of ξ given $\hat{\xi}=80$ is $e_1(80)=\frac{\underline{\xi}+\bar{\xi}}{2}=45$.

Therefore, as in the level-k model, if the $L1$ receiver receives a message $\hat{\xi}\leq 79$, then he updates his belief that the sender is of type $L0$ and, therefore, believes the message is truthful. In particular, we have $E^k\left[\xi\mid\hat{\xi}\right]=\hat{\xi}$. If he receives a message $\hat{\xi}=80$, then the sender could be either $L0$ and $L1$, though the types differ in the probability with which they could have sent this message. From Equation (25), we have

$$\begin{aligned}E^{1}\left[\xi\mid\hat{\xi}=80\right]&=\frac{e_{0}(80)\,f_{0}(80)\,p_{0}(\tau)+e_{1}(80)\,f_{1}(80)\,p_{1}(\tau)}{f_{0}(80)\,p_{0}(\tau)+f_{1}(80)\,p_{1}(\tau)}\\&=\frac{80+3195\tau}{1+71\tau}.\end{aligned} \tag{31}$$

From Equation (27), the $L1$ receiver's optimal action is

$$a_1\left(\hat{\xi}\right)=\begin{cases}\hat{\xi}, & \hat{\xi}\leq 79;\\ E^1\left[\xi\mid\hat{\xi}=80\right], & \hat{\xi}=80,\end{cases}\tag{32}$$

where we have substituted $\frac{r}{c}=1$ for the cheap talk experiment. Thus, the $L1$ receiver's behavior is the same as in the level-k model for $\hat{\xi}\leq 79$, believing the message to be truthful. For $\hat{\xi}=80$, the level-k model predicts that the receiver ignores the message and takes action $a_1(80)=45$ because the sender is assumed to be type $L1$. In contrast, the CH model in general predicts a higher action because the sender could still be of type $L0$ with finite positive probability. While the predicted action is 80 if $\tau=0$, it is decreasing in τ, and converges quite rapidly to 45: the predicted action is 46.9 for $\tau=0.25$, 45.5 for $\tau=1$ and 45.2 for $\tau=2$, and 45.1 for $\tau=5$. Thus, the predictions are practically the same for both models for reasonable values of τ , i.e., $\tau\in[1,2]$. Intuitively, even though the prior probability of the sender being type $L0$ may not be negligible, the posterior probability that the message $\hat{\xi}=80$ is from the $L0$ type is considerably small for reasonable τ.

Next, consider an $L2$ sender. She believes that the receiver can be of type $L0$ or $L1$, assigning a probability $\frac{p_0}{p_0+p_1}$ to type $L0$. For messages $\hat{\xi}\leq 79$, both receiver types believe the message and take action $\hat{\xi}$. Therefore, the sender must at least inflate the message to 79. For $\hat{\xi}=80$, the $L0$ receiver takes action 80, whereas the $L1$ receiver takes the action $E^1\left[\xi\mid\hat{\xi}=80\right]$. Hence, the expected receiver action is

$$\begin{aligned}E^1\left[a_t(80)\right]&=\frac{a_0(80)\,p_0+a_1(80)\,p_1}{p_0+p_1}=\frac{80+E^1\left[\xi\mid\hat{\xi}=80\right]\tau}{1+\tau}\\&=\frac{80+5750\tau+3195\tau^2}{1+72\tau+71\tau^2}.\end{aligned}\tag{33}$$

While the expected receiver action is 80 if $\tau=0$, it is decreasing in τ reasonably quickly towards 45: it is 73.4 for $\tau=0.25$, 62.7 for $\tau=1$, 56.8 for $\tau=2$ and 50.9 for $\tau=5$. Therefore, for reasonable values of τ, the $L2$ sender sends the message $\hat{\xi}=79$, the same as the $L2$ sender in the level-k model. We proceed similarly to obtain the predicted behaviors for higher types.

Table 3 provides a comparison of predicted behaviors of sender types under the level-k and CH models. Specifically, each row shows the message that will be sent by the $L1$ to $L6$ sender types. For the CH model, the predictions are shown for specific values of τ in the range $[0.25,5]$. We observe that an Lk sender in the CH model distorts the message to a particular message level that is the same as that sent by a sender of level Lk or lower in the level-k model. The reason is that the CH model assigns higher probability to the lower receiver types than the level-k model. Moreover, the predicted behaviors in the CH model change over a narrower range with the player's type than in the level-k model.

Table 3: Predictions of Level-k vs. CH model for Senders

Model		Sender Type					
	τ	L1	L2	L3	L4	L5	L6
Level-k	-	80	79	78	77	76	75
CH	0.25	80	79	79	79	79	79
CH	0.5	80	79	78	78	78	78
CH	1	80	79	78	77	77	77
CH	1.5	80	79	78	77	76	76
CH	2	80	79	78	77	76	75
CH	5	80	79	78	77	76	75

For example, Table 3 shows that, depending on τ, an $L5$ sender in the CH model sends the message 76, 77, 78 or 79, thus resembling the behavior, respectively, of an $L2$, $L3$, $L4$ or $L5$ sender in the level-k model. Further, for $\tau = 1$, all sender types higher than $L3$ send same message 77; for $\tau = 2$, it can be shown that all sender types higher than $L5$ send the same message 75. Intuitively, because the CH model assigns higher probability to lower types, especially for high k and low τ, the behaviors of the higher level senders in the CH model resembles that of lower level senders in the level-k model beyond a threshold level of thinking.

Table 4 provides a comparison of predicted behaviors of receiver types $L1$ to $L6$ under the level-k and CH models. Specifically, each table shows the behaviors under the level-k model or the CH model for a particular value of τ in the range $[0.25, 5]$. Each row in a table shows the response of a receiver of a particular level of thinking to sender messages $\hat{\xi} \in [10, 80]$. We observe that the predictions of the CH model resemble those of level-k model in the following respects. First, a receiver believes all messages up to a threshold message level and then discounts all higher messages. Second, the threshold message level for an Lk receiver in the CH model is the same as that of a receiver of level Lk or lower in the level-k model. Similar to the case of senders, the reason is that the CH model assigns higher probability to the lower sender types than the level-k model. Lastly, the predicted actions for messages higher than the threshold in the CH model is practically the same as that of the corresponding receiver type with the same threshold in the level-k model; in particular, the predicted behaviors differ only for a few messages and are hence practically indistinguishable. Moreover, the predicted behaviors in the CH model change over a narrower range with the player's type than in the level-k model.

For example, an $L2$ receiver in the CH model believes all messages up to 78 (same as the $L2$

receiver in the level-k model) and takes practically the same action for higher messages. Further, depending on τ, an $L5$ receiver believes all messages up to 78, 77, 76 or 75, and the behavior is practically indistinguishable from that of the $L2$, $L3$, $L4$ or $L5$ receiver, respectively, in the level-k model. Lastly, we note that for $\tau = 1$, all receiver types higher than $L3$ believe messages up to 76 and discount messages 77 and higher; for $\tau = 2$, it can be shown that all receiver types higher than $L5$ believe messages up to 74 and discount messages 75 and higher. Thus, the range of predicted behaviors is narrower than in the level-k model.

Table 4: Predictions of Level-k vs. CH model for Receivers

	Level-k Model							CH Model ($\tau = 0.25$)						
Receiver	Sender Message ($\hat{\xi}$)							Sender Message ($\hat{\xi}$)						
Type	≤ 74	75	76	77	78	79	80	≤ 74	75	76	77	78	79	80
L1	$\hat{\xi}$	75	76	77	78	79	45	$\hat{\xi}$	75	76	77	78	79	46.9
L2	$\hat{\xi}$	75	76	77	78	45	45	$\hat{\xi}$	75	76	77	78	55.6	46.9
L3	$\hat{\xi}$	75	76	77	45	45	45	$\hat{\xi}$	75	76	77	78	55.0	46.9
L4	$\hat{\xi}$	75	76	45	45	45	45	$\hat{\xi}$	75	76	77	78	55.0	46.9
L5	$\hat{\xi}$	75	45	45	45	45	45	$\hat{\xi}$	75	76	77	78	55.0	46.9
L6	$\hat{\xi}$	45	45	45	45	45	45	$\hat{\xi}$	75	76	77	78	55.0	46.9

	CH Model ($\tau = 1$)							CH Model ($\tau = 1.5$)						
Receiver	Sender Message ($\hat{\xi}$)							Sender Message ($\hat{\xi}$)						
Type	≤ 74	75	76	77	78	79	80	≤ 74	75	76	77	78	79	80
L1	$\hat{\xi}$	75	76	77	78	79	45.5	$\hat{\xi}$	75	76	77	78	79	45.3
L2	$\hat{\xi}$	75	76	77	78	45.9	45.5	$\hat{\xi}$	75	76	77	78	45.4	45.3
L3	$\hat{\xi}$	75	76	77	47.6	45.9	45.5	$\hat{\xi}$	75	76	77	45.8	45.4	45.3
L4	$\hat{\xi}$	75	76	53.1	47.6	45.9	45.5	$\hat{\xi}$	75	76	47.0	45.8	45.4	45.3
L5	$\hat{\xi}$	75	76	52.0	47.6	45.9	45.5	$\hat{\xi}$	75	50.6	47.0	45.8	45.4	45.3
L6	$\hat{\xi}$	75	76	51.9	47.6	45.9	45.5	$\hat{\xi}$	75	49.7	47.0	45.8	45.4	45.3

	CH Model ($\tau = 2$)							CH Model ($\tau = 5$)						
Receiver	Sender Message ($\hat{\xi}$)							Sender Message ($\hat{\xi}$)						
Type	≤ 74	75	76	77	78	79	80	≤ 74	75	76	77	78	79	80
L1	$\hat{\xi}$	75	76	77	78	79	45.2	$\hat{\xi}$	75	76	77	78	79	45.1
L2	$\hat{\xi}$	75	76	77	78	45.2	45.2	$\hat{\xi}$	75	76	77	78	45.0	45.1
L3	$\hat{\xi}$	75	76	77	45.3	45.2	45.2	$\hat{\xi}$	75	76	77	45.0	45.0	45.1
L4	$\hat{\xi}$	75	76	45.7	45.3	45.2	45.2	$\hat{\xi}$	75	76	45.0	45.0	45.0	45.1
L5	$\hat{\xi}$	75	46.6	45.7	45.3	45.2	45.2	$\hat{\xi}$	75	45.0	45.0	45.0	45.0	45.1
L6	$\hat{\xi}$	49.1	46.6	45.7	45.3	45.2	45.2	$\hat{\xi}$	45.0	45.0	45.0	45.0	45.0	45.1

Appendix F Mixture of L0 Players

Theorem 4. *An Lk sender's strategy for $k > 0$ is $\hat{\xi}_k(\xi) = \hat{\xi}_k = \max\left\{\bar{\xi} - (k-1), \frac{\bar{\xi}+\underline{\xi}}{2}\right\}$. An Lk receiver's strategy for $k > 0$ is*

$$a_k\left(\hat{\xi}\right) = \begin{cases} \frac{r}{c}\left(\eta\hat{\xi} + (1-\eta)\frac{(\bar{\xi}+\underline{\xi})}{2}\right), & \hat{\xi} \leq \tilde{\xi}_k; \\ a_{NI} = \frac{r}{c}\frac{(\bar{\xi}+\underline{\xi})}{2}, & \textit{otherwise}, \end{cases}$$

where $\tilde{\xi}_k = \hat{\xi}_k - 1$.

Proof. The $L1$ sender's expected payoff is

$$\Pi_{S1}\left(\hat{\xi}, \xi\right) = s\mathbf{E}\left[q \mid \xi\right] a_0\left(\hat{\xi}\right) = s\frac{r}{c}\left[\mu\hat{\xi} + (1-\mu)\frac{(\bar{\xi}+\underline{\xi})}{2}\right]\xi, \tag{34}$$

and her best response is $\hat{\xi}_1 = \bar{\xi}$ for any ξ. The $L1$ receiver believes sender is $L1$ if the message is $\hat{\xi} = \bar{\xi}$, and the sender is $L0$ otherwise; if the sender is $L0$, her message is truthful with probability η and uninformative otherwise. The $L1$ receiver's expected payoff is

$$\Pi_{R1}\left(a, \hat{\xi}\right) = \begin{cases} r\left[\eta\hat{\xi} + (1-\eta)\frac{(\bar{\xi}+\underline{\xi})}{2}\right] a - \frac{1}{2}ca^2, & \hat{\xi} \leq \bar{\xi} - 1; \\ r\frac{(\bar{\xi}+\underline{\xi})}{2}a - \frac{1}{2}ca^2, & \hat{\xi} = \bar{\xi}. \end{cases} \tag{35}$$

Therefore, his optimal action is

$$a_1\left(\hat{\xi}\right) = \begin{cases} \frac{r}{c}\left[\eta\hat{\xi} + (1-\eta)\frac{(\bar{\xi}+\underline{\xi})}{2}\right], & \hat{\xi} \leq \bar{\xi} - 1; \\ \frac{r}{c}\frac{(\bar{\xi}+\underline{\xi})}{2}, & \hat{\xi} = \bar{\xi}. \end{cases} \tag{36}$$

The $L2$ sender's expected payoff is

$$\Pi_{S2}\left(\hat{\xi}, \xi\right) = s\xi a_1\left(\hat{\xi}\right), \tag{37}$$

and her best response is $\hat{\xi}_2 = \bar{\xi} - 1$ for any ξ. From hereon, the result can be proved by induction as in Theorem 3. □

The model estimation results are provided below. We observe that in this level-k model, the behavior of the $L1$ receiver can be substantially different than the $L0$ receiver depending on μ. Similarly, the payoff function of the $L1$ sender can differ from the $L2$ sender depending on η. Hence, we include a separate $L1$ sender and a fully-believing $L0$ receiver. We remark that the belief μ for $L1$ senders and η for higher level senders are not separately estimable from their λ parameters as both essentially rescale the systematic payoff.

Table 5: Level-k Model with Randomizing $L0$ players

		Senders		Receivers	
Model Estimates	Classification	$L0$ truthful	17 (47.22%)	$L0$ believing	1 (2.78%)
		$L0$ random	0 (0%)	$L0$ random	3 (8.33%)
		$L1$	6 (16.67%)	$L1\sim3$	5 (13.89%)
		$L2\sim3$	12 (33.33%)	LH	27 (75.00%)
		LH	1 (2.78%)		
	Model Parameters	$\hat{\xi}_{LH}$	68*	$\tilde{\xi}_{LH}$	46*
		σ_{L0}	6.24*	$\mu_{L1\sim3}$	0.88
		$\lambda_{L1}\cdot\mu_{L1}$	4.26*	μ_{LH}	1.00*
		$\lambda_{L2\sim3}\cdot\eta_{L2\sim3}$	2.00*	λ_{L0}	100.00*
		$\lambda_{LH}\cdot\eta_{LH}$	22.25*	$\lambda_{L1\sim3}$	23.66*
				λ_{LH}	5.75*
In-Sample Model Fit	LL	-710.91		-773.15	
	AIC	1439.82		1564.29	
	BIC	1469.58		1593.88	
Out-of-Sample Performance	MSE	440.89		260.00	
	$\hat{\beta}$	0.66		0.47	
	R^2	0.35		0.38	
Experimental Manipulation	Classification	$L0$ truthful	7 (29.17%)	$L0$ believing	4 (16.67%)
		$L0$ random	0 (0%)	$L0$ random	0 (0%)
		$L1$	13 (54.17%)	$L1\sim3$	2 (8.33%)
		$L2\sim3$	0 (0%)	LH	18 (75.00%)
		LH	4 (16.67%)		
	Model Parameters	$\hat{\xi}_{LH}$	51*	$\tilde{\xi}_{LH}$	50*
		σ_{L0}	9.08*	$\mu_{L1\sim3}$	0.00
		λ_{L1}	4.58*	μ_{LH}	1.00*
		$\lambda_{L2\sim3}$	2.58*	λ_{L0}	8.49*
		λ_{LH}	4.37*	$\lambda_{L1\sim3}$	100.00*
				λ_{LH}	3.90*
	LL	-481.42		-519.99	
	AIC	980.84		1057.98	
	BIC	1006.78		1083.92	

Appendix G Trembling Behavior

Unlike in the original level-k model, the $L1$ sender's message can be partially informative. Specifically, the $L0$ receiver is fully believing, and her decision $a_0\left(\hat{\xi}\right)$ is governed by the random-utility choice process. Her expected action $\mathbf{E}\left[a_0\left(\hat{\xi}\right)\right]$ is strictly increasing in $\hat{\xi}$. The $L1$ sender's expected systematic payoff $s\mathbf{E}\left[a_0\left(\hat{\xi}\right)\right]\xi$, therefore, is strictly increasing in $\hat{\xi}$ and maximum at $\hat{\xi}=\bar{\xi}$; we observe that the loss in this payoff from deviating to a message other than $\bar{\xi}$ is lower if ξ is lower. Consequently, under the influence of the logit shock, the $L1$ sender is more likely to deviate to $\hat{\xi}<\bar{\xi}$ if ξ is lower. In other words, lower messages are more likely when the actual information is lower. Hence, $\hat{\xi}_1(\xi)$ is partially informative. Correspondingly, the $L1$ receiver is influenced by the $L1$ sender's message, taking lower actions for lower messages.

Figure 3: Predicted Behaviors for $\lambda = 1, 5, 10$

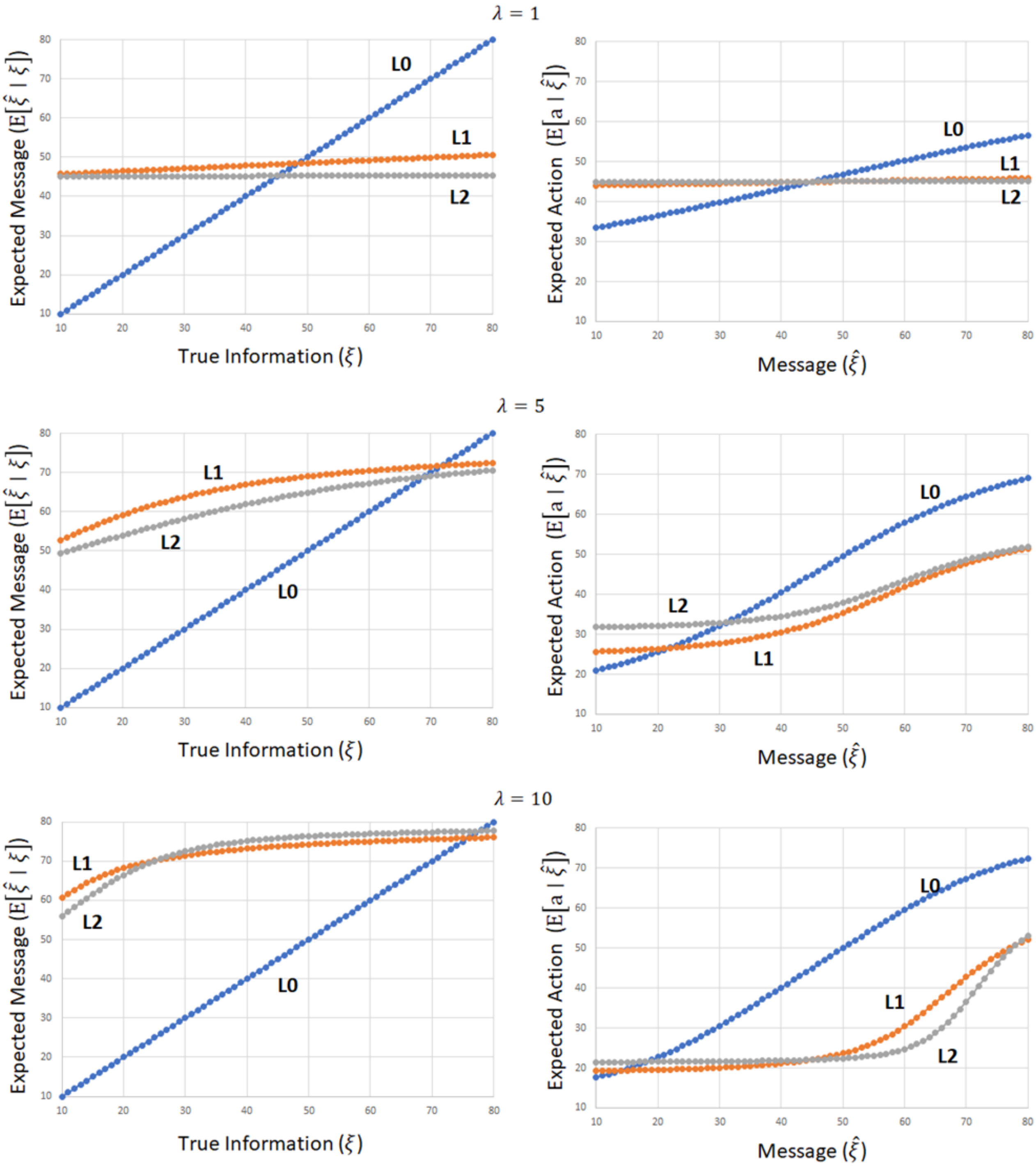
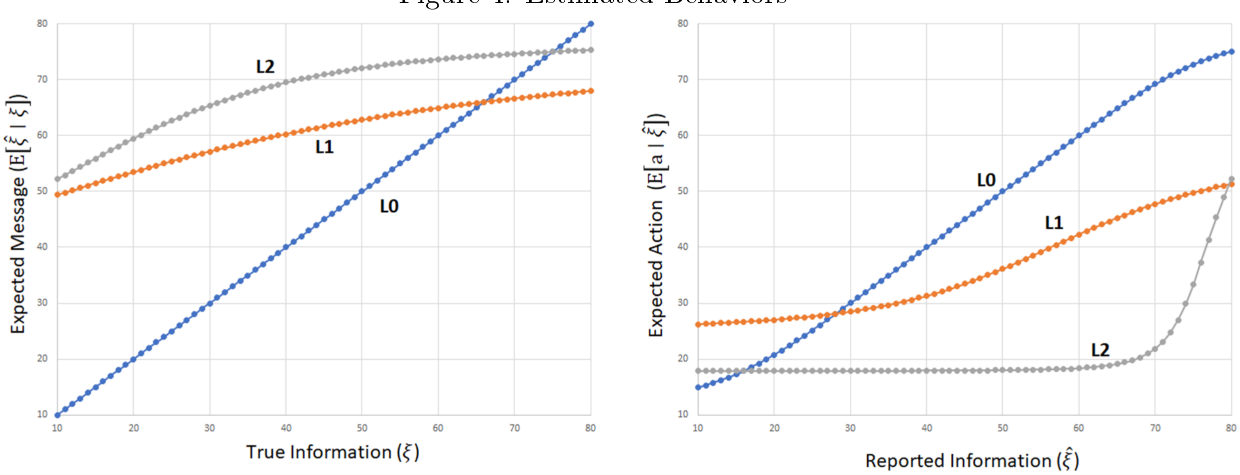


Figure 3 depicts sender and receiver behaviors for $\lambda = 1, 5, 10$. We observe that depending on λ, $L1$ and $L2$ sender messages can be informative and the $L1$ and $L2$ receivers are influenced by the messages. The model estimation results are given in Table 6. Since this model predicts probabilistic behaviors, it is not possible to directly compare the predictions with those of the other models, which predict deterministic behaviors. Therefore, Table 6 does not include the out-of-sample performance metrics.

Table 6: Level-k Model with Trembling Behavior

		Senders		Receivers	
Model Estimates	Classification	$L0$	17 (47.22%)	$L0$	6 (16.67%)
		$L1$	14 (38.89%)	$L1$	28 (77.78%)
		$L2$	5 (13.89%)	$L2$	2 (5.55%)
	Model Parameters	σ_{L0}	6.17*	λ_{L0}	23.40*
		λ_{L1}	3.18*	λ_{L1}	4.77*
		λ_{L2}	7.01*	λ_{L2}	15.91
In-Sample Model Fit	LL	-716.39		-778.54	
	AIC	1442.79		1567.08	
	BIC	1459.23		1583.52	
Experimental Manipulation	Classification	$L0$	7 (29.17%)	$L0$	1 (4.17%)
		$L1$	12 (50.00%)	$L1$	23 (95.83%)
		$L2$	5 (20.83%)	$L2$	0 (0%)
	Model Parameters	σ_{L0}	9.20*	λ_{L0}	10.60
		λ_{L1}	3.50*	λ_{L1}	5.35*
		λ_{L2}	13.26*	λ_{L2}	2.00
	LL	-475.80		-522.38	
	AIC	961.6		1054.75	
	BIC	976.01		1069.16	

Figure 4: Estimated Behaviors



Appendix H Trust-embedded Model with Level-k Types

Table 7: Hybrid Trust-embedded model with LH type

		Senders		Receivers	
Model Estimates	Classification	*High*	4 (11.11 %)	*High*	9 (25.00%)
		Medium	12 (33.33%)	*Medium*	3 (8.33%)
		Low	19 (52.78%)	*Low*	19 (52.78%)
		LH	1 (2.78%)	*LH*	5 (13.89%)
	Model Parameters	$\hat{\xi}_{LH}$	48*	$\tilde{\xi}_{LH}$	69*
		A_H	1.03*	α_{RH}	0.70*
		A_M	1.07*	α_{RM}	0.13
		A_L	2.5*	α_{RL}	0.00
		$\lambda_H \cdot \gamma_H$	807.04*	λ_H	25.59*
		$\lambda_M \cdot \gamma_M$	23.52*	λ_M	122.09*
		$\lambda_L \cdot \gamma_L$	0.98*	λ_L	3.73*
		λ_{LH}	15.29*	λ_{LH}	51.31*
In-Sample Model Fit	LL	-685.77		-735.50	
	AIC	1393.53		1493.00	
	BIC	1429.70		1529.17	
Out-of-Sample Performance	MSE	286.63		161.65	
	$\hat{\beta}$	0.77		0.61	
	R^2	0.49		0.46	
Experimental Manipulation	Classification	*High*	1 (4.17 %)	*High*	4 (16.67%)
		Medium	6 (25.00%)	*Medium*	6 (25.00%)
		Low	12 (50.00%)	*Low*	11 (45.83%)
		LH	5 (20.83%)	*LH*	3 (12.50%)
	Model Parameters	$\hat{\xi}_{LH}$	45*	$\tilde{\xi}_{LH}$	63*
		A_H	1.03*	α_{RH}	0.62*
		A_M	1.21*	α_{RM}	0.43
		A_L	2.90*	α_{RL}	0.00
		$\lambda_H \cdot \gamma_H$	612.74*	λ_H	77.62*
		$\lambda_M \cdot \gamma_M$	25.60*	λ_M	6.97*
		$\lambda_L \cdot \gamma_L$	1.53*	λ_L	3.91*
		λ_{LH}	2.52*	λ_{LH}	84.03*
	LL	-460.97		-493.2	
	AIC	944.09		1008.33	
	BIC	975.80		1040.04	

Appendix I Level-k Model with Sender Lying Cost

The sender incurs a disutility $\frac{1}{2}\gamma\left(\hat{\xi}-\xi\right)^2$. Similar to the sender in the trust-embedded model, an $L1$ sender inflates messages depending on her lying cost by a factor $A_{L1} = 1 + \frac{sr}{\gamma c} = 1 + \frac{1}{2\gamma}$. An $L1$ receiver anticipates this behavior and discounts messages accordingly; importantly, the receiver expects the $L1$ sender messages to be partially informative and is hence influenced by her messages.

Messages that could not have been from the $L1$ sender ($\hat{\xi} < A_{L1}\underline{\xi}$) are taken to be from the truthful $L0$ sender. An $L2$ sender anticipates that the $L1$ receiver discounts higher messages, and hence inflating messages is less effective. As a result, the $L2$ sender inflates messages by a lower extent, $A_{L2} = 1 + \frac{\frac{sr}{\gamma c}}{A_{L1}} < A_{L1}$. An $L2$ receiver, in turn, is partially influenced by the messages; messages that could not have been from a $L2$ sender are either taken to be from a $L1$ sender (if feasible) or from a $L0$ sender. Thus, unlike the original level-k model, the behaviors of each higher level type are quite distinct. As indicated in the main text, we estimate the model allowing for $L0$, $L1$ and $L2$ player types. The table below provides the model estimation results. The figure depicts the estimated behaviors.

Table 8: Hybrid Level-k Model with Sender Lying Cost

		Senders		Receivers	
Model Estimates	Classification	$L0$	5 (13.89 %)	$L0$	3 (8.33%)
		$L1$	19 (52.78%)	$L1$	11 (30.56%)
		$L2$	12 (33.33%)	$L2$	22 (61.11%)
	Model Parameters	γ_{L1}	0.15	γ_{L1}	0.25*
		γ_{L2}	6.26*	γ_{L2}	1.43*
		σ_{L0}	2.62*	λ_{L0}	50.11
		λ_{L1}	3.17*	λ_{L1}	4.22*
		λ_{L2}	2.00*	λ_{L2}	7.24*
In-Sample Model Fit	LL	-694.35		-756.90	
	AIC	1402.70		1527.80	
	BIC	1425.72		1550.82	
Out-of-Sample Performance	MSE	498.86		201.93	
	$\hat{\beta}$	0.69		0.63	
	R^2	0.30		0.40	
Experimental Manipulation	Classification	$L0$	1 (4.17 %)	$L0$	0 (16.67%)
		$L1$	17 (25.00%)	$L1$	5 (25.00%)
		$L2$	6 (20.83%)	$L2$	19 (12.50%)
	Model Parameters	γ_{L1}	0.07	γ_{L1}	2.83*
		γ_{L2}	2.96*	γ_{L2}	0.79*
		σ_{L0}	2.00*	λ_{L0}	50.89
		λ_{L1}	3.24*	λ_{L1}	30.95*
		λ_{L2}	6.94*	λ_{L2}	3.79*
	LL	-467.07		-515.17	
	AIC	948.15		1044.33	
	BIC	968.33		1064.51	

Figure 5: Predicted Behaviors of Senders and Receivers from Model Estimates