Appendix A: Proofs of Propositions

Proofs of Propositions 1, 4 and 5

G(B), T4 and T5 belong to the following game $\Gamma(d^R, d^S)$, which is the uniform linear case of the veto threats model we study in De Groot Ruiz, Offerman & Onderstal (2012b). $\Gamma(d^R, d^S)$ proceeds as game G(B). However, the Sender's type t is drawn from the interval [0,1]. The Receiver's and Sender's payoff on the real line are given by $U^R(x) = -x$ and $U^S(x,t) = -|x-t|$. The disagreement point payoff is $U^R(\delta) = -d^R$ and $U^S(\delta) = -d^S$ with $d^R, d^S > 0$. In De Groot Ruiz, Offerman & Onderstal (2012b), we show that the equilibria of $\Gamma(d^R, d^S)$ can be characterized as follows:

Lemma 1 *Let* $\overline{x} = \max\{0, \min\{d^R - 2d^S, 1 - d^S\}\}$. *Any equilibrium of the game is a partition equilibrium that can be described by a natural number* $n \in \{1, \ldots, \overline{n}\}$ *and a set of equilibrium actions* $\{a_1, \ldots, a_n\}$, *such that*

(i) $a_1 = \max\{0, \min\{1 - d^S, d^S, \frac{1}{2}(d^R - d^S)\}\}$ if $n = 1$

(ii) $a_1 = \min\{d^S, \max\{0, a_2 - 2d^S\}\}$ if $n \geq 2$

(iii) $a_2 = \min\{\frac{2}{3}(d^R - d^S), 2d^S, 1 - d^S\}$ if $n = 2$ and $a_1 = 0$

(iv) $a_k = a_{k-1} + 2d^S$ if a_{k-1} exists and $a_{k-1} > 0$

(v) $a_n \leq \overline{x}$ if $d^R \geq 4d^S$

The maximum size $\overline{n}$ *is equal to 1 if* $d^S \geq 1$. *If* $d^S < 1$, $\overline{n} = \max\left\{2, \left\lceil \frac{d^R}{2d^S} \right\rceil\right\}$ *if* $d^R \leq d^S + 1$ *and* $\overline{n} = \max\left\{2, \left\lceil \frac{3}{2} + \frac{1}{2d^S} \right\rceil\right\}$ *otherwise, where* $\lceil\ .\ \rceil$ *is the ceiling function.*

From Proposition 5 in (the Online Appendix of) De Groot Ruiz, Offerman & Onderstal (2012a), it follows that

Lemma 2 *The unique ACDC equilibrium of $\Gamma(d^R, d^S)$ with respect to credible neologisms is the maximum size equilibrium with the highest equilibrium action.*

G(B) corresponds to $\Gamma(d^R, d^S)$ with $d^R = \frac{5}{4}\frac{120}{B}$ and $d^S = \frac{1}{2}\frac{120}{B}$. T4 corresponds to $\Gamma(\frac{5}{8}, \frac{1}{4})$ and T5 to $\Gamma(\frac{5}{4}, \frac{1}{4})$. Propositions 1, 4 and 5 are direct corollaries of Lemmas 1 and 2.

Proofs of Propositions 2 and 3

Proof of Proposition 2 Let $a(t)$ characterize the equilibrium outcome. In our game, $\langle \tilde{a}, [\underline{\tau}, \overline{\tau}] \rangle$ is a credible neologism iff $U^S(\tilde{a}, t) < U^S(a(t), t) \ \ \forall t \notin [\underline{\tau}, \overline{\tau}]$, $U^S(\tilde{a}, t) > U^S(a(t), t) \forall t \in (\underline{\tau}, \overline{\tau})$ and $\tilde{a} = a^*[\underline{\tau}, \overline{\tau}]$. Hence $\tilde{a} < a_1$ implies $\underline{\tau} = 0$ and $\tilde{a} > a_n$ implies $\underline{\tau} = \ B$.

First, let us look at pooling equilibrium σ^P. Consider a low credible neologism $\tilde{a}^L < a = 45$. Now, $\underline{\tau}^L = 0$. Furthermore, $\overline{\tau}^L = \dfrac{1}{2}(\overline{a}^L + 45) < 60$. Hence, $\tilde{a}^L = a^*[0, \overline{\tau}] = 0$ and $\overline{\tau}^L$ must be 22.5. Next, consider a high credible neologism $\tilde{a}^H > 45$, $\overline{\tau}^H = \ B$ and $\underline{\tau}^H = \dfrac{1}{2}(\overline{a}^H + 45)$. Solving $a^*[\dfrac{1}{2}(\overline{a}^H + 45), B] = \tilde{a}^H$ yields $\tilde{a}^H = \min\{\ B - 60, 75\} > 45$. Consequently, $\underline{\tau}^H = \min\{\dfrac{B-15}{2}, 60\}$.

Second, let us look at the separating equilibrium σ^S. There can be no credible equilibrium $\tilde{a} < a_1$ as $a_1 = 0$. Consider a credible neologism $\tilde{a} > 60$. Now, $\overline{\tau} = \quad B$ and $\underline{\tau} = \dfrac{1}{2}(d + 60)$. Solving $a^*[\dfrac{1}{2}(d + 60), B] = \tilde{a}$ yields $\tilde{a} = \min\{B - 60, 80\}$. Hence, $\underline{\tau} = \min\{\dfrac{B}{2}, 70\}$. If $B = 120$, then $\tilde{a} = 60$ and it is no neologism. If $B > 120$, it is a neologism. Finally, consider some neologism with $a_1 = 0 < \tilde{a} < a_2 = 60$. Since $\tilde{a} < 60$, it must be that $\overline{\tau} < 60$. However, if $\overline{\tau} < 60$, then $a^*[\underline{\tau}, \overline{\tau}] = 0$. Hence $\tilde{a}$ cannot be a neologism. *Q.E.D.*

Proof of Proposition 3 First, we show that $ACD(\sigma^P) > ACD(\sigma^S)$. Let $\underline{\tau}^H$ be the lowest deviating type of the high neologism in the pooling equilibrium σ^P and $\underline{\tau}$ the lowest deviating type of the neologism in the separating equilibrium σ^S. Due to the low credible neologism, $CD(t, \sigma^P) > CD(t, \sigma^S) = 0$ for $t \in [0, \frac{45}{2})$. For $t \in [\frac{45}{2}, \underline{\tau}^H)$, $CD(t, \sigma^P) = CD(t, \sigma^S) = 0$. Since the distance between the neologism action and the equilibrium action is larger in the pooling equilibrium than in the separating equilibrium and $\underline{\tau}^H < \underline{\tau}$, it must hold that $CD(t, \sigma^P) > CD(t, \sigma^S)$ for $t \in (\underline{\tau}^H, 120]$. Furthermore, $CD(t, \sigma^P) = CD(t, \sigma^S) = 1$ for $t \in [120, B]$. Hence, $E_t[CD(t, \sigma^P)] > E_t[CD(t, \sigma^S)]$.

For the second result, observe that the set of rationalizable actions for the Receiver is $[0, B-60]$ and that the Sender can always guarantee herself a payoff of 0 by rejecting the proposed action. This means that $\overline{U}^S(t) = U^S(\min\{t, B-60\}, t)$ and $\underline{U}^S(t) = \max\{0, \min\{U^S(0,t), \quad U^S(B-60, t)\}\}$. Using Proposition 1 and Proposition 2, we get for the ACD of the separating equilibrium

$$ACD(\sigma^S) = \frac{1}{B} \int_{\min\{70, B/2\}}^{120} \frac{\{(60 - |t - (\min\{80, B-60\}|) - (60 - |\, t - 60 \,|)\}}{\overline{U}^S(t) - \underline{U}^S(t)} dt$$

$+\frac{B-120}{B}$. It is readily verified that this function is zero for $B = 120$ and strictly increasing in B for $B \geq 120$. *Q.E.D.*

Appendix B (Online): Neologism Dynamic

We first describe the standard, simple, best response dynamic. In each period all Sender types and the Receiver choose a strategy. We assume that the Sender in the acceptance stage accepts all actions that yield her nonnegative payoff: $\nu(a,t)=1$ if $U^S(a,t)\geq 0$ and $\nu(a,t)=0$ otherwise. The strategy of the Sender in period r is then given by $\mu_r : T\rightarrow \Delta M$ and that of the Receiver by $\alpha_r : M\rightarrow A$. Let $m_r(t)$ denote the message Sender type t sends (which may be a random variable) and $a_r(m)$ denote the Receiver's action after receiving message m. Both players best respond to the strategy of the other player in the previous round. First, the support of $\mu_r(t)$ is equal to $\arg\max_{m\in M} U^S(a_{r-1}(m),t)$. In particular, we assume the Sender randomizes uniformly over the set of best responses. Second, $a_r(m)=\arg\max_{a\in A} U^R(a,t)E_t[\nu(a,t)\mid \beta^r(m)]$, where $\beta^r(m)$ is derived from μ_{r-1} by Bayes rule whenever possible.[27] If β^r cannot be derived from μ_{r-1}, then $\beta^r=\beta^r(m)$ for some randomly chosen $m\in \cup_{t\in T}\operatorname{supp}\mu_{r-1}(t)$.

The neologism dynamic differs from the best response dynamic on one crucial aspect: Senders can send credible neologisms, which will be believed. We define $\langle\tilde{a},N\rangle$ as a credible neologism with respect to Receiver strategy α_r if (i) $U^S(\tilde{a},t)>\arg\max_{m\in M} U^S(a_r(m),t)\cdot\nu(a_r(m),t)$ for all $t\in N$, (ii) $U^S(\tilde{a},t)\leq \arg\max_{m\in M} U^S(a_r(m),t)\cdot\nu(a_r(m),t)$ for all $t\notin N$ and (iii) $\tilde{a}=\arg\max_{a\in A} U^R(a,t)E_t[\nu(a,t)\mid t\in N]$.[28]

[27] We assume (for ease of exposition) that there is one unique best response for the Receiver, which is generically the case in our game. In case there are more optimal actions one could let the Receiver randomize.

[28] We need to point out the following subtlety. If a credible neologism was used in the previous period, it becomes just a message (which may have acquired a new 'meaning'). If the same credible neologism has to be made in the following period, it cannot be the same literal message, as then it would not be a neologism. Hence, the Sender can add for instance Really! or Really, Really! etc. to make it a neologism and distinguish it from the old message.

Now, in the neologism dynamic all Senders that can send a credible neologism in round r with respect to α_{r-1}, will do so and such credible neologisms will be believed by the Receivers in round r. In all other cases, the dynamic is identical to a best response dynamic. We call the neologism dynamic $f(\mu_r, a_r)$.

This best response dynamic bears similarities to a level-k analysis. The difference is that in level-k, in each iteration just one player (Sender or Receiver) changes her strategy. In the best response dynamic, both players change their strategy each period. Still, the best response dynamic converges in all cases below to very similar outcomes as the outcomes a level-k analysis would converge to.

Before analyzing the dynamic, we characterize the best responses and neologisms. The Sender's best response is simply to induce the action closest to her type. We call the Receiver's best response $a^*[\underline{t}, \overline{t}]$ if Sender types are uniformly distributed in the interval $[\underline{t}, \overline{t}]$. $a^*[\underline{t}, \overline{t}]$ is single-valued and equal to $\min\{\overline{t} - 60, 45 + \frac{1}{2}\underline{t}\}$. Let $\overline{a} = \max_{m \in M}\{a_r(m)\}$ be the highest action of a Receiver's strategy. Then, for $B = 120$ and $B = 130$, there exists a high credible neologism with respect to a_r if and only if $\overline{a} < B - 60$. In particular, it is equal to $\left\langle B - 60, (\frac{B - 60 + \overline{a}}{2}, 130] \right\rangle$ if $3(B - 120) \leq \overline{a} < B - 60$ and $\left\langle 60 + \overline{a} / 3, (\frac{2}{3}(45 + \overline{a}), 130] \right\rangle$ if $\overline{a} < 3(B - 120)$. For $B = 210$, there exists a high credible neologism if and only if $\overline{a} < 90$, and in this case it is equal to $\left\langle 60 + \frac{1}{3}\overline{a}, (\frac{2}{3}(45 + \overline{a}), 130] \right\rangle$.

We restrict our analysis to two natural initial strategy profiles: babbling (where no information is transmitted) and naive (where all possible information is transmitted).

For G(120), G(130) and G(210), we (i) give the attractor,[29] (ii) show that both the babbling and naive initial profiles lie in its basis of attraction and (iii) calculate the average prediction error of the pooling and separating equilibria for the attractor.

G(120)

For $B = 120$, it is easy to check that the equilibrium profile is a steady state of the neologism dynamic: $m_r(t) = m^1$ for $t \in [0,30]$ and $m_r(t) = m^2 \neq m^1$ for $t \in [30,120]$, and $a_r(m^1) = 0$ and $a_r(m^2) = 60$. It is a steady state of the best response dynamic and no neologism relative to a_r exists.

If we start with a babbling profile in period 1, the neologism dynamic proceeds as follows:

Strategy Sender period 1 (Babbling)	Strategy Receiver period 1 (Babbling)
$m_1(t) \sim U[0,120]$ if $t \in [0,120]$	$a_1(m) = 45$ for all $m \in [0,120]$

where all Senders randomize uniformly over the interval [1,120].

Strategy Sender period 2 (Babbling)	Strategy Receiver period 2 (Babbling)
$m_2(t) = n^1$ if $t \in [0,45/2)$	$a_2(m) = 0$ if $m = n^1$
$m_2(t) \sim U[0,120]$ if $0 < t_6^1 = 10 < 15$	$a_2(m) = 45$ if $m \in [0,120]$
$m_2(t) = n^2$ if $t \in (105/2,120]$	$a_2(m) = 60$ if $m = n^2$

where $n^1 = \langle 0,[0,45/2) \rangle$ and $n^2 = \langle 60,[105/2,120) \rangle$

Strategy Sender period 3 (Babbling)	Strategy Receiver period 3 (Babbling)
$m_3(t) = n^1$ if $t \in [0,45/2)$	$\frac{285}{7} \simeq 40.7$ if $m \in [0,120] \cup \{n^1\}$
$m_3(t) \sim U[0,120]$ if $t \in [45/2,105/2)$	$a_3(m) = 60$ if $m = n^2$
$m_3(t) = n^2$ if $t \in [105/2,120]$.	

[29] An attractor is roughly speaking a set in the phase-space the neighborhood of which the dynamic evolves to after sufficient time. This can be, for instance, a steady state or a higher n-cycle.

Strategy Sender period 4 (Babbling)	Strategy Receiver period 4 (Babbling)
$m_4(t) \sim U[0,120] \cup \{n^1\}$ if $t \in [0,30)$	$a_4(m) = 0$ if $m \in [0,120] \cup \{n^1\}$
$m_4(t) = n^2$ if $t \in [30,120]$	$a_4(m) = 60$ if $m = n^2$

Hence, from period 4, the dynamic is and stays in the separating equilibrium.

If we start with a naive profile in period 1, the neologism dynamic proceeds as follows:

Strategy Sender period 1 (Naive)	Strategy Receiver period 1 (Naive)
$m_1(t) = t$ if $t \in [0,120]$	$a_1(m) = 0$ if $m \in [0,60]$
	$a_1(m) = m - 60$ if $m \in [60,120]$

where all Senders randomize uniformly over the interval [1,120]

Strategy Sender period 2 (Naive)	Strategy Receiver period 2 (Naive)
$m_2(t) \sim U[0,60]$ if $t = 0$	$a_2(m) = 0$ for all $m \in [0,60]$
$m_2(t) = t + 60$ if $t \in (0,60)$	$a_2(m) = m - 60$ for all $m \in [60,120]$
$m_2(t) = 120$ if $t \in [60,120]$	

[Strategy Sender period 3 (Naive)	Strategy Receiver period 3 (Naive)
$m_3(t) \sim U[0,60]$ if $t = 0$	$a_3(m) = 0$ if $m \in [0,120)$
$m_3(t) = t + 60$ if $t \in [0,60)$	$a_3(m) = 60$ if $m = 120$
$m_3(t) = 120$ if $t \in [60,120]$	

Strategy Sender period 4 (Naive)	Strategy Receiver period 4 (Naive)
$m_4(t) \sim U[0,120)$ if $t \in [0,30)$	$a_4(m) = 0$ if $m \in [0,120)$
$m_4(t) = 120$ if $t \in [30,120]$	$a_4(m) = 60$ if $m = 120$

Hence, from period 4, the dynamic is and stays in the separating equilibrium.

Now we turn to the prediction error. Let the equilibrium profile be σ^e and the attracting profile σ^a. Then, the average (or expected) prediction error of an equilibrium for the attracting profile is $E\left[\left|a^e(m^e(t)) - a^a(m^a(t))\right|\right]$. The average prediction error of the separating equilibrium is obviously 0. The prediction error of the pooling equilibrium is $\frac{1}{120}\left(\int_0^{30}|45-0|dt + \int_{30}^{120}|45-60|dt\right) = 45/2$.

G(130)

For $B = 130$, consider the following state r':

Strategy Sender period r'	Strategy Receiver period r'
$m_{r'}(t) = m^1$ if $t \in [0, t^1)$	$a_{r'}(m) = 0$ if $m \in \{m^1, m^2\}$
$m_{r'}(t) = m^2$ if $t \in [t^1, t^2)$	$a_{r'}(m) = a^1$ if $m = m^3$
$m_{r'}(t) = m^3$ if $t \in [t^2, 130]$	

with the restriction that $0 \le t^1 < t^2 < 50$ and $50 < a1 < 70$. m^1, m^2, m^3 can be any three messages.

Then, by straightforwardly applying the neologism dynamic, we get the following for rounds $r'+1, r'+2, r'+3$ and $r'+4$

Strategy Sender period $r'+1$	Strategy Receiver period $r'+1$
$m_{r'+1}(t) \sim U\{m^1, m^2\}$ if $t \in [0, a^1/2)$	$a_{r'+1}(m) = 0$ if $m \in \{m^1, m^2\}$
$m_{r'+1}(t) = m^3$ if $t \in [a^1/2, 35 + a^1/2]$	$a_{r'+1}(m) = 45 + t^2/4$ if $m = m^3$
$m_{r'+1}(t) = n^1$ if $t \in (35 + a^1/2, 130]$	$a_{r'+1}(m) = 70$ if $m = n^1$

where n^1 is the credible neologism $\langle 70, (35 + a^1/2, 130] \rangle$. Furthermore, a Sender in $[0, a^1/2)$, will randomize uniformly over m^1 and m^2.

Strategy Sender period $r+2$	Strategy Receiver period $r'+2$
$m_{r'+2}(t) \sim U\{m^1, m^2\}$ if $t \in [0, 45/2 + t^2/4)$	$a_{r'+1}(m) = 0$ if $m \in \{m^1, m^2\}$
$m_{r'+2}(t) = m^3$ if $t \in [45/2 + t^2/4, 115/2 + t^2/4)$	$a_{r'+1}(m) = a^1/2 - 25$ if $m = m^3$
$m_{r'+2}(t) = n^1$ if $t \in [115/2 + t^2/4, 130]$	$a_{r'+1}(m) = 70$ if $m = n^1$

Hence, if player type is in $[0, a^1/2)$, then she will randomize uniformly over m^1 and m^2.

Strategy Sender period $r'+3$	Strategy Receiver period $r^{'}+3$
$m_{r'+3}(t) \sim U\{m^1, m^2\}$ if $t \in [0, a^1/4 - 25/2)$	$a_{r'+3}(m) = 0$ if $m \in \{m^1, m^2\}$
$m_{r'+3}(t) = m^3$ if $t \in [a^1/4 - 25/2, a^1/4 + 45/2)$	$a_{r'+3}(m) = t^2/4 - 5/2$ if $m = m^3$
$m_{r'+3}(t) = n^1$ if $t \in [a^1/4 + 45/2, 130]$	$a_{r'+3}(m) = 70$ if $m = n^1$

Strategy Sender period $r'+4$	Strategy Receiver period $r^{'}+4$
$m_{r'+4}(t) \sim U\{m^1, m^2\}$ if $t \in [0, t^2/8 - 5/4)$	$a_{m+4}(m) = 0$ if $m \in \{m^1, m^2, m^3\}$
$m_{r'+4}(t) = m^3$ if $t \in [t^2/8 - 5/4, t^2/8 + 135/4)$	$a_{r'+4}(m) = a^1/8 + 225/4$ if $m = n^1$
$m_{r'} + 4(t) = n^1$ if $t \in [t^2/8 + 135/4, 130]$	

Hence, starting at period r' ,we can characterize f^4 by $a^1_{p+1} = a^1_p/8 + 225/4$, t^1_p , $t^1_{p+1} = t^2_p/8 - 5/4$ and $t^2_{p+1} = 135/4 + t^2_{p+1}/8$ (as long as $0 \le t^1_p < t^2_p < 50$ and $50 < a^1_p < 70$).

$a^1_p = 450/7, t^2_p = 270/7$ and $t^1_p = 25/7$ is a steady state and attractor to which the dynamic converges monotonically. Hence, if in some period the strategy profile meets the conditions in r', then f converges to the 4-cycle characterized by above values.

We proceed to give the first periods of the neologism dynamic for the babbling and naive initial conditions. We end as soon as the dynamic meets the sufficient conditions for their respective attractors specified above.

If we start with a babbling profile in period 1, the neologism dynamic proceeds as follows:

Strategy Sender period 1 (Babbling)	Strategy Receiver period 1 (Babbling)
$m_1(t) \sim U[0, 130]$ if $t \in [0, 130]$	$a_1(m) = 45$ for all $m \in [0, 130]$

Strategy Sender period 2 (Babbling)	Strategy Receiver period 2 (Babbling)
$m_2(t) = n^1$ if $t \in [0, 45/2)$	$a_2(m) = 0$ if $m = n^1$
$m_2(t) \sim U[0,130]$ if $t \in [45/2, 115/2]$	$a_2(m) = 45$ if $m \in [0,130]$
$m_2(t) = n^2$ if $t \in (115/2, 130]$	$a_2(m) = 70$ if $m = n^2$

where $n^1 = \langle 0, [0, 45/2) \rangle$ and $n^2 = \langle 70, (115/2, 130] \rangle$.

Strategy Sender period 3 (Babbling)	Strategy Receiver period 3 (Babbling)
$m_3(t) = n^1$ if $t \in [0, 45/2)$	$a_3(m) = 0$ if $m \in [0,130] \cup \{n^1\}$
$m_3(t) \sim U[0,130]$ if $t \in [45/2, 115/2)$	$a_3(m) = 70$ if $m = n^2$
$m_3(t) = n^2$ if $t \in [115/2, 130]$	

Strategy Sender period 4 (Babbling)	Strategy Receiver period 4 (Babbling)
$m_4(t) \sim U[0,130] \cup n^1$ if $t \in [0, 35)$	$a_4(m) = 0$ if $m \in [0,130] \cup n^1$
$m_4(t) = n^2$ if $t \in [35, 130]$	$a_4(m) = 70$ if $m = n^2$

Strategy Sender period 5 (Babbling)	Strategy Receiver period 5 (Babbling)
$m_5(t) \sim U[0,130] \cup n^1$ if $t \in [0, 35)$	$a_5(m) = 0$ if $m \in [0,130] cup n^1$
$m_5(t) = n^2$ if $t \in [35, 130]$	$a_5(m) = 125/2$ if $m = n^2$

Strategy Sender period 6 (Babbling)	Strategy Receiver period 6 (Babbling)
$m_6(t) \sim U[0,130] \cup \{n^1\}$ if $t \in [0, 125/4)$	$a_6(m) = 0$ if $m \in [0,130] \cup \{n^1\}$
$m_6(t) = n^2$ if $t \in (125/4, 265/4]$	$a_6(m) = 125/2$ if $m = n^2$
$m_6(t) = n^3$ if $t \in (265/4, 130]$	$a_6(m) = 70$ if $m = n^3$

where $n^3 = \langle 70, (265/4, 130] \rangle$.

Strategy Sender period 7 (Babbling)	Strategy Receiver period 7 (Babbling)
$m_7(t) \sim U[0,130] \cup \{n^1\}$ if $t \in [0, 125/4)$	$a_7(m) = 0$ if $m \in [0,130] \cup \{n^1\}$
$m_7(t) = n^2$ if $t \in [125/4, 265/4)$	$a_7(m) = 25/4$ if $m = n^2$
$m_7(t) = n^3$ if $t \in [265/4, 130]$	$a_7(m) = 70$ if $m = n^3$

Strategy Sender period 8 (Babbling)	Strategy Receiver period 8 (Babbling)
$m_8(t) \sim U[0,130] \cup \{n^1\}$ if $t \in [0, 25/8)$	$a_8(m) = 0$ if $m \in [0,130] \cup \{n^1, n^2\}$
$m_8(t) = n^2$ if $t \in [25/8, 305/8)$	$a_8(m) = 25/4$ if $m = n^2$
$m_8(t) = n^3$ if $t \in [305/8, 130]$	$a_8(m) = 70$ if $m = n^3$

Strategy Sender period 9 (Babbling)	Strategy Receiver period 9 (Babbling)
$m_9(t) \sim U[0,130] \cup \{n^1, n^2\}$ if $t \in [0, 25/8)$	$a_9(m) = 0$ if $m \in [0,130] \cup \{n^1, n^2\}$
$m_9(t) = n^2$ if $t \in [25/8, 585/16]$	$a_9(m) = 1025/16$ if $m = n^3$
$m_9(t) = n^3$ if $t \in [585/16, 130]$	

Strategy Sender period 10 (Babbling)	Strategy Receiver period 10 (Babbling)
$m_{10}(t) \sim U[0,130] \cup \{n^1, n^2\}$ if $t \in [0, 1025/32)$	$a_{10}(m) = 0$ if $m \in [0,130] \cup \{n^1, n^2\}$
$m_{10}(t) = n^3$ if $t \in [1025/32, 2145/32]$	$a_{10}(m) = 125/2$ if $m = n^3$
$m_{10}(t) = n^4$ if $t \in (2145/32, 130]$	$a_{10}(m) = 70$ if $m = n^4$

where $n^4 = \langle 70, (2145/32, 130] \rangle$.

Strategy Sender period 11 (Babbling)	Strategy Receiver period 11 (Babbling)
$m_{11}(t) \sim U[0,130] \cup \{n^1, n^2\}$ if $t \in [0, 125/4)$	$a_{11}(m) = 0$ if $m \in [0,130] \cup \{n^1, n^2\}$
$m_{11}(t) = n^3$ if $t \in [125/4, 265/4)$	$a_{11}(m) = 225/32$ if $m = n^3$
$m_{11}(t) = n^4$ if $t \in [265/4, 130]$	$a_{11}(m) = 70$ if $m = n^4$

Strategy Sender period 12 (Babbling)	Strategy Receiver period 12 (Babbling)
$m_{12}(t) \sim U[0,130] \cup \{n^1, n^2\}$ if $t \in [0, 225/64)$	$a_{12}(m) = 0$ if $m \in [0,130] \cup \{n^1, n^2\}$
$m_{12}(t) = n^3$ if $t \in [225/64, 2465/64)$	$a_{12}(m) = 25/4$ if $m = n^3$
$m_{12}(t) = n^4$ if $t \in [2465/64, 130]$	$a_{12}(m) = 70$ if $m = n^4$

Strategy Sender period 13 (Babbling)	Strategy Receiver period 13 (Babbling)
$m_{13}(t) \sim U[0,130] \cup \{n^1, n^2\}$ if $t \in [0, 25/8)$	$a_{13}(m) = 0$ if $m \in [0,130] \cup \{n^1, n^2, n^3\}$
$m_{13}(t) = n^3$ if $t \in [25/8, 305/8)$	$a_{13}(m) = 8225/128$ if $m = n^4$
$m_{13}(t) = n^4$ if $t \in [305/8, 130]$	

Now, $t_{13}^1 = 25/8 < t_{13}^2 = 305/8 < 50$ and $50 < a_{13}^1 = 8225/128 < 70$. Hence, period 13 meets the requirements of round r' and the dynamic converges to the attracting four-cycle.

If we start with a naive profile in period 1, the neologism dynamic proceeds as follows:

Strategy Sender period 1 (Naive)	Strategy Receiver period 1 (Naive)
$m_1(t) = t \quad \text{if } t \in [0,130]$	$a_1(m) = 0 \text{ if } m \in [0,60]$
	$a_1(m) = m - 60 \text{ if } m \in [60,130]$

Strategy Sender period 2 (Naive)	Strategy Receiver period 2 (Naive)
$m_2(t) \sim U[0,60] \quad \text{if } t = 0$	$a_1(m) = 0 \text{ if } m \in [0,60]$
$m_2(t) = t + 60 \text{ if } t \in (0,70)$	$a_1(m) = m - 60 \text{ if } m \in [60,130]$
$m_2(t) = 130 \text{ if } t \in [70,130]$	

Strategy Sender period 3 (Naive)	Strategy Receiver period 3 (Naive)
$m_3(t) \sim U[0,60] \quad \text{if } t = 0$	$a_3(m) = 0 \text{ if } m \in [0,120)$
$m_3(t) = t + 60 \text{ if } t \in [0,70)$	$a_3(m) = m - 120 \text{ if } m \in [120,130)$
$m_3(t) = 120 \text{ if } t \in [70,130]$	$a_3(m) = 70 \text{ if } m = 130$

Strategy Sender period 4 (Naive)	Strategy Receiver period 4 (Naive)
$m_4(t) \sim U[0,120] \quad \text{if } t = 0$	$a_4(m) = 0 \text{ if } m \in [0,120)$
$m_4(t) = t + 120 \text{ if } t \in [0,10)$	$a_4(m) = m - 120 \text{ if } m \in [120,130)$
$m_4(t) = 130 - \epsilon \text{ if } t \in [10,40)$	$a_4(m) = 70 \text{ if } m = 130$
$m_4(t) = 130 \text{ if } t \in [40,130]$	

Strategy Sender period 5 (Naive)	Strategy Receiver period 5 (Naive)
$m_5(t) \sim U[0,120] \quad \text{if } t = 0$	$a_5(m) = 0 \text{ if } m \in [0,130)$
$m_5(t) = t + 120 \text{ if } t \in [0,10)$	$a_5(m) = 65 \text{ if } m = 130$
$m_5(t) = 130 - \epsilon \text{ if } t \in [10,40)$	
$m_5(t) = 130 \text{ if } t \in [40,130]$	

Strategy Sender period 6 (Naive)	Strategy Receiver period 6 (Naive)
$m_6(t) \sim U[0,130) \text{ if } t \in [0,65/2)$	$a_6(m) = 0 \text{ if } m \in [0,130)$
$m_6(t) = 130 \text{ if } t \in [65/2,135/2]$	$a_6(m) = 65 \text{ if } m = 130$
$m_6(t) = n_1 \text{ if } t \in (135/2,130]$	$a_6(m) = 70 \text{ if } m = n_1$

where $n_1 = \langle 70,(135/2,130] \rangle$.

Strategy Sender period 7 (Naive)	Strategy Receiver period 7 (Naive)
$m_7(t) \sim U[0,130) \text{ if } t \in [0,65/2)$	$a_7(m) = 0 \text{ if } m \in [0,130)$
$m_7(t) = 130 \text{ if } t \in [65/2,135/2]$	$a_7(m) = 15/2 \text{ if } m = 130$
$m_7(t) = n_1 \text{ if } t \in (135/2,130]$	$a_7(m) = 70 \text{ if } m = n_1$

Strategy Sender period 8 (Naive)	Strategy Receiver period 8 (Naive)
$m_8(t) \sim U[0,130)$ if $t \in [0,15/4)$	$a_8(m) = 0$ if $m \in [0,130)$
$m_8(t) = 130$ if $t \in [15/4,155/4]$	$a_8(m) = 15/2$ if $m = 130$
$m_8(t) = n_1$ if $t \in (155/4,130]$	$a_8(m) = 70$ if $m = n_1$

Strategy Sender period 9 (Naive)	Strategy Receiver period 9 (Naive)
$m_9(t) \sim U[0,130)$ if $t \in [0,15/4)\}$	$a_9(m) = 0$ if $m \in [0,130]$
$m_9(t) = 130$ if $t \in [15/4,155/4]\}$	$a_9(m) = 515/8$ if $m = n_1$
$m_9(t) = n_1$ if $t \in (155/4,130]\}$	

Now, $t_9^1 = 15/4 < t_9^2 = 155/4 < 50$ and $50 < a_9^1 = 515/8 < 70$. Hence, period 9 meets the requirements of round r' and the dynamic converges to the attracting four-cycle.

Finally, we turn to the prediction errors for the attracting four-cycle. First the pooling equilibrium. In the same way as above, it can be straightforwardly calculated that prediction error of the pooling equilibrium in periods r', $r'+1$, $r'+2$ and $r'+3$ is respectively equal to $\frac{17145}{637}, \frac{2585}{91}, \frac{304}{91}$ and $\frac{2640}{91}$. Hence, the average prediction error of the pooling equilibrium over the four cycle is $\frac{18750}{637} \simeq 29.4$. The prediction error of the separating equilibrium in periods r', $r'+1$, $r'+2$ and $r'+3$ is respectively equal to $\frac{4440}{637}, \frac{635}{91}, \frac{1825}{91}$ and $\frac{7625}{91}$. Hence, the average prediction error of the separating equilibrium over the four cycle is $\frac{29285}{2548} \simeq 11.5$.

G(210)

We continue with $B = 210$. Consider the following state r':

Strategy Sender period r'	Strategy Receiver period r'
$m_{r'}(t) = m^1$ if $t \in [0, t^1)$	$a_{r'}(m) = 0$ if $m \in \{m^1, m^2\}$
$m_{r'}(t) = m^2$ if $t \in [t^1, t^2)$	$a_{r'}(m) = a^1$ if $m = m^3$
$m_{r'}(t) = m^3$ if $t \in [t^2, t^3)$	$a_{r'}(m) = a^2$ if $m = m^4$
$m_{r'}(t) = m^4$ if $t \in [t^3, t^4)$	$a_{r'}(m) = a^3$ if $m = m^5$
$m_{r'}(t) = m^5$ if $t \in [t^4, t^5]$	$a_{r'}(m) = a^4$ if $m = n^1$
$m_{r'}(t) = n^1$ if $t \in (t^5, 210]$	

where $t^1 < t^2 < t^3 < t^4 < t^5$ with $0 < t^1 < 15$, $t^3 < 60$ and $t^5 < 90$; $0 < a^1 < a^2 < a^3 < a^4$ with $a^2 < 30$ and $a^4 < 90$ and $n^1 = \langle a^4, [t^5, 210] \rangle$.

Then, by straightforwardly applying the neologism dynamic, we get for round $r' + 1$:

Strategy Sender period $r'+1$	Strategy Receiver period $r'+1$
$m_{r'+1}(t) = m^1$ if $t \in [0, a^1 / 2)$	$a_{r'+1}(m) = 0$ if $m \in \{m^1, m^2, m^3\}$
$m_{r'+1}(t) = m^3$ if $t \in [a^1 / 2, (a^1 + a^2) / 2)$	$a_{r'+1}(m) = t^4 - 60$ if $m = m^4$
$m_{r'+1}(t) = m^4$ if $t \in [(a^1 + a^2) / 2, (a^2 + a^3) / 2)$	$a_{r'+1}(m) = t^5 - 60$ if $m = m^5$
$m_{r'+1}(t) = m^5$ if $t \in [(a^2 + a^3) / 2, (a^3 + a^4) / 2)$	$a_{r'+1}(m) = 45 + t^5 / 2$ if $m = n^1$
$m_{r'+1}(t) = n^1$ if $t \in [(a^3 + a^4) / 2, \frac{2}{3}(45 + a^4)]$	$a_{r'+1}(m) = 60 + a^4 / 3$ if $m = n^2$
$m_{r'+1}(t) = n^2$ if $t \in (\frac{2}{3}(45 + a^4), 210]$	

where $n^2 = \left\langle 60 + a^4 / 3, (\frac{2}{3}(45 + a^4), 210] \right\rangle$.

Hence, for period $r \geq r'$ we can describe f by $a^4_{r+1} = 60 + a^4_r / 3$, $t^5_{r+1} = \frac{2}{3}(45 + a^4_r / 3)$, $a^3_{r+1} = 45 + t^5_r / 2$, $t^4_{r+1} = \frac{1}{2}(a^3_r + a^4_r)$, $a^2_{r+1} = t^5_r - 60$, $t^3_{r+1} = \frac{1}{2}(a^2_r + a^3_r)$, $a^1_{r+1} = t^4_r - 60$, $t^2_{r+1} = \frac{1}{2}(a^1_r + a^2_r)$ and $t^1_{r+1} = \frac{1}{2} a^1_r$ (as long as $a^1_r, \ldots, a^5_r$ and $t^1_r, \ldots, t^5_r$ meet the above conditions).

Since $a^4_{r+1} = 60 + a^4_r / 3$, a^4_r converges monotonically to 90. Consequently, it follows that

$a_r^4 = 90$, $t_r^5 = 90$, $a_r^3 = 90$, $t_r^4 = 90$, $a_r^2 = 30$, $t_r^3 = 60$, $a_r^1 = 30$, $t_r^2 = 30$ and $t_r^1 = 15$ is an attractor for this dynamic to which converges. (It is not a steady state, as if $a_r^4 = 90$, then no neologism could be made. Nonetheless, the profile is never reached and all points in its neighborhood converge to it.)

We now proceed to give the first periods of the neologism dynamic for the babbling and naive initial conditions.

If we start with a babbling profile in period 1, the neologism dynamic proceeds as follows:

Strategy Sender period 1 (Babbling)	Strategy Receiver period 1 (Babbling)
$m_1(t) \sim U[0,210]$ if $t \in [0,210]$	$a_1(m) = 45$ for all $m \in [0,210]$

Strategy Sender period 2 (Babbling)	Strategy Receiver period 2 (Babbling)
$m_2(t) = n^1$ if $t \in [0,45/2)$	$a_2(m) = 0$ if $m = n^1$
$m_2(t) \sim U[0,210]$ if $t \in [45/2,60]$	$a_2(m) = 45$ if $m \in [0,210]$
$m_2(t) = n^2$ if $t \in (60,210]$	$a_2(m) = 75$ if $m = n^2$

where $n^1 = \langle 0,[0,45/2) \rangle$ and $n^2 = \langle 75,(60,210] \rangle$.

Strategy Sender period 3 (Babbling)	Strategy Receiver period 3 (Babbling)
$m_3(t) = n^1$ if $t \in [0,45/2)$	$a_3(m) = 0$ if $m \in [0,210] \cup \{n^1\}$
$m_3(t) \sim U[0,210]$ if $t \in [45/2,60)$	$a_3(m) = 75$ if $m = n^2$
$m_3(t) = n^2$ if $t \in [60,80]$	$a_3(m) = 85$ if $m = n^3$
$m_3(t) = n^3$ if $t \in (80,210]$	

where $n^3 = \langle 85,(80,210] \rangle$.

Strategy Sender period 4 (Babbling)	Strategy Receiver period 4 (Babbling)
$m_4(t) \sim U[0,210] \cup \{n^1\}$ if $t \in [0,75/2)$	$a_4(m) = 0$ if $m \in [0,210] \cup \{n^1\}$
$m_4(t) = n^2$ if $t \in [75/2,80)$	$a_4(m) = 20$ if $m = n^2$
$m_4(t) = n^3$ if $t \in [80,260/3]$	$a_4(m) = 85$ if $m = n^3$
$m_4(t) = n^4$ if $t \in (260/3,210]$	$a_4(m) = 265/3$ if $m = n^4$

where $n^4 = \langle 265/3,(260/3,210] \rangle$.

Strategy Sender period 5 (Babbling)	Strategy Receiver period 5 (Babbling)
$m_5(t) \sim U[0,210] \cup \{n^1\}$ if $t \in [0,10)$	$a_5(m) = 0$ if $m \in [0,210] \cup \{n^1\}$
$m_5(t) = n^2$ if $t \in [10,105/2)$	$a_5(m) = 20$ if $m = n^2$
$m_5(t) = n^3$ if $t \in [105/2,260/3)$	$a_5(m) = 80/3$ if $m = n^3$
$m_5(t) = n^4$ if $t \in [260/3,800/9]$	$a_5(m) = 265/3$ if $m = n^4$
$m_5(t) = n^5$ if $t \in (800/9,210]$	$a_5(m) = 805/9$ if $m = n^5$

where $n^5 = \langle 805/9,(800/9,210] \rangle$.

Strategy Sender period 6 (Babbling)	Strategy Receiver period 6 (Babbling)
$m_6(t) \sim U[0,210] \cup \{n^1\}$ if $t \in [0,10)$	$a_6(m) = 0$ if $m \in [0,210] \cup \{n^1, n^2\}$
$m_6(t) = n^2$ if $t \in [10,70/3)$	$a_6(m) = 80/3$ if $m = n^3$
$m_6(t) = n^3$ if $t \in [70/3,115/2)$	$a_6(m) = 260/9$ if $m = n^4$
$m_6(t) = n^4$ if $t \in [115/2,800/9)$	$a_6(m) = 805/9$ if $m = n^5$
$m_6(t) = n^5$ if $t \in [800/9,2420/5]$	$a_6(m) = 2425/27$ if $m = n^6$
$m_6(t) = n^6$ if $t \in (2420/27,210]$	

where $n^6 = \langle 2425/27,(2420/27,210] \rangle$.

Now, $0 < t_6^1 = 10 < 15$, $t_6^3 = 115/2 < 60$, $t_6^5 = 2420/27 < 90$, $a_6^2 = 260/9 < 30$ and $a_6^4 = 2425/27 < 90$ Hence, period 6 meets the requirements of round r' and the dynamic converges to the attractor.

If we start with a naive profile in period 1, the neologism dynamic proceeds as follows:

Strategy Sender period 1 (Naive)	Strategy Receiver period 1 (Naive)
$m_1(t) = t$ if $t \in [0,210]$	$a_1(m) = 0$ if $m \in [0,60]$
	$a_1(m) = m - 60$ if $m \in [60,210]$

Strategy Sender period 2 (Naive)	Strategy Receiver period 2 (Naive)
$m_2(t) \sim U[0,60]$ if $t = 0$	$a_2(m) = 0$ for all $m \in [0,60]$
$m_2(t) = t + 60$ if $t \in (0,150)$	$a_2(m) = m - 60$ for all $m \in [60,210]$
$m_2(t) = 210$ if $t \in [150,210]$	

Strategy Sender period 3 (Naive)	Strategy Receiver period 3 (Naive)
$m_3(t) \sim U[0,60]$ if $t = 0$	$a_3(m) = 0$ if $m \in [0,120)$
$m_3(t) = t + 60$ if $t \in (0,150)$	$a_3(m) = m - 120$ if $m \in [120,210)$
$m_3(t) = 210$ if $t \in [150,210]$	$a_3(m) = 120$ if $m = 210$

Strategy Sender period 4 (Naive)	Strategy Receiver period 4 (Naive)
$m_4(t) \sim U[0,120]$ if $t=0$	$a_4(m)=0$ if $m \in [0,120)$
$m_4(t)=t+120$ if $t \in (0,90)$	$a_4(m)=m-120$ if $m \in [120,210)$
$m_4(t)=210-\epsilon$ if $t \in [90,105)$	$a_4(m)=120$ if $m=210$
$m_4(t)=210$ if $t \in [105,210]$	

Strategy Sender period 5 (Naive)	Strategy Receiver period 5 (Naive)
$m_5(t) \sim U[0,120]$ if $t=0$	$a_5(m)=0$ if $m \in [0,180)$
$m_5(t)=t+120$ if $t \in (0,90)$	$a_5(m)=m-180$ if $m \in [180,210-\epsilon)$
$m_5(t)=210-\epsilon$ if $t \in [90,105)$	$a_5(m)=45$ if $m=210-\epsilon$
$m_5(t)=210$ if $t \in [105,210]$	$a_5(m)=195/2$ if $m=210$

Strategy Sender period 6 (Naive)	Strategy Receiver period 6 (Naive)
$m_6(t) \sim U[0,180]$ if $t=0$	$a_6(m)=0$ if $m \in [0,180)$
$m_6(t)=t+180$ if $t \in (0,30)$	$a_6(m)=m-180$ if $m \in [180,210-\epsilon)$
$m_6(t)=210-2\epsilon$ if $t \in [30,75/2)$	$a_6(m)=45$ if $m=210-\epsilon$
$m_6(t)=210-\epsilon$ if $t \in [75/2,285/4)$	$a_6(m)=195/2$ if $m=210$
$m_6(t)=210$ if $t \in [285/4,210]$	

Strategy Sender period 7 (Naive)	Strategy Receiver period 7 (Naive)
$m_6(t) \sim U[0,180]$ if $t=0$	$a_7(m)=0$ if $m \in [0,210-2\epsilon)$
$m_7(t)=t+180$ if $t \in (0,30)$	$a_7(m)=45/4$ if $m=210-\epsilon$
$m_7(t)=210-2\epsilon$ if $t \in [30,75/2)$	$a_7(m)=645/8$ if $m=210$
$m_7(t)=210-\epsilon$ if $t \in [75/2,285/4)$	
$m_7(t)=210$ if $t \in [285/4,210]$	

Strategy Sender period 8 (Naive)	Strategy Receiver period 8 (Naive)
$m_8(t) \sim U[0,210-2\epsilon)$ if $t \in [0,45/8)$	$a_8(m)=0$ if $m \in [180,210-2\epsilon)$
$m_8(t)=210-\epsilon$ if $t \in [45/8,735/16)$	$a_8(m)=45/4$ if $m=210-\epsilon$
$m_8(t)=210$ if $t \in [735/16,335/4)$	$a_8(m)=645/8$ if $m=210$
$m_8(t)=n^1$ if $t \in [335/4,210]$	$a_8(m)=695/8$ if $m=n^1$

where $n^1=\langle 695/8,(335/4,210]\rangle$.

Strategy Sender period 9 (Naive)	Strategy Receiver period 9 (Naive)
$m_9(t) \sim U[0, 210 - 2\epsilon)$ if $t \in [0, 45/8)$	$a_9(m) = 0$ if $m \in [0, 210 - \epsilon)$
$m_9(t) = 210 - \epsilon$ if $t \in [45/8, 735/16)$	$a_9(m) = 95/4$ if $m = 210$
$m_9(t) = 210$ if $t \in [735/16, 335/4)$	$a_9(m) = 695/8$ if f $m = n^1$
$m_9(t) = n^1$ if $t \in [335/4, 1055/12]$	$a_9(m) = 2135/24$ if $m = n^2$
$m_9(t) = n^2$ if $t \in (1055/12, 210]$	

where $n^2 = \langle 2135/24, (1055/12, 210] \rangle$.

Strategy Sender period 10 (Naive)	Strategy Receiver period 10 (Naive)
$m_{10}(t) \sim U[0, 210 - \epsilon)$ if $t \in [0, 95/8)$	$a_{10}(m) = 0$ if $m \in [0, 210 - \epsilon)$
$m_{10}(t) = 210$ if $t \in [95/8, 885/16)$	$a_{10}(m) = 95/4$ if $m = 210$
$m_{10}(t) = n^1$ if $t \in [885/16, 1055/12)$	$a_{10}(m) = 335/12$ if $m = n^1$
$m_{10}(t) = n^2$ if $t \in [1055/12, 3215/36]$	$a_{10}(m) = 2135/24$ if $m = n^2$
$m_{10}(t) = n^3$ if $t \in (3215/36, 210]$	$a_{10}(m) = 6455/72$ if $m = n^3$

where $n^3 = \langle 6455/72, (3215/36, 210] \rangle$.

Strategy Sender period 11 (Naive)	Strategy Receiver period 11 (Naive)
$m_{11}(t) \sim U[0, 210 - \epsilon)$ if $t \in [0, 95/8)$	$a_{11}(m) = 0$ if $m \in [0, 210]$
$m_{11}(t) = 210$ if $t \in [95/8, 155/6)$	$a_{11}(m) = 335/12$ if $m = n^1$
$m_{11}(t) = n^1$ if $t \in [155/6, 935/16)$	$a_{11}(m) = 1055/36$ if $m = n^2$
$m_{11}(t) = n^2$ if $t \in [935/16, 3215/36)$	$a_{11}(m) = 6455/72$ if $m = n^3$
$m_{11}(t) = n^3$ if $t \in [3215/36, 9695/108]$	$a_{11}(m) = 19415/216$ if $m = n^4$
$m_{11}(t) = n^4$ if $t \in (9695/108, 210]$	

where $n^4 = \langle 19415/216, (9695/108, 210] \rangle$.

Now, $t_{11}^1 = 95/8 < 15$, $t_{11}^3 = 935/16 < 60$, $t_{11}^5 = 9695/108 < 90$, $a_{11}^2 = 1055/36 < 30$ and $a_{11}^4 = 19415/216 < 90$. Hence, period 11 meets the requirements of round r' and the dynamic converges to the attractor.

Finally, we turn to the prediction errors for of the equilibria with respect to the attractor. The average prediction error of the pooling equilibrium is equal to $\frac{285}{7} \simeq 40.7$. The average prediction error of the separating equilibrium is equal to $\frac{195}{7} \simeq 27.9$.

Appendix C (Online): Instructions

We include the experimental instructions (including check questions) of the G(120) treatment for both the "Chooser" (Sender) and "Proposer" (Receiver) roles. The instructions of the G(130) and G(210) treatments are very similar.

Instructions Chooser

INSTRUCTIONS

Welcome to this decision-making experiment. Please read these instructions carefully. We will first provide you with an outline of the instructions and then we will proceed with a detailed description of the instructions.

OUTLINE

Experiment

- At the start of the experiment you will receive a starting capital of 100 points. In addition, you can earn points with your decisions.
- At the end of the experiment, you receive 1,5 (one-and-a-half) euro for each 100 points earned.
- The experiment consists of around 50 periods.
- Your role in the whole experiment is: **CHOOSER**.
- In each period, you will be randomly paired with a different participant who performs the role of Proposer.

Sequence of events

- In each period, you and the Proposer will bargain over an outcome, which can be any number between 0 and 120.
- Your preferred outcome is a number between 0 and 120. Any number between 0 and 120 is equally likely. The Proposer's preferred outcome is always 0.
- Each period you will receive a new (random) preferred outcome. You are the only one who is informed about your preferred outcome.
- After learning your preferred outcome, you will send a SUGGESTION for a proposal (between 0 and 120) to the Proposer.
- The Proposer is informed of your suggestion and makes a PROPOSAL (between 0 and 120) for the outcome.
- After you have been informed of the proposal, you accept or reject it.
- At the end of a period, you are informed of the points you earned (your payoff).

Payoffs

- When you accept a proposal, your payoff is 60 minus the distance between your preferred outcome and the proposal.
- The Proposer's payoff is 60 minus 0.4 times the proposal in this case.
- When you reject a proposal, you receive 0 points and the Proposer receives 0 points.

History Overview

When making a decision, you may use the History Overview, which provides an overview of the results of the other Chooser/Proposer pairs (including your own pair) in the 15 most recent periods. The left part of the overview is a Table with four columns SUGGESTION, PROPOSAL, ACCEPTANCE and PREFERRED OUTCOME. In a row, you will find a particular pair's suggestion, the corresponding proposal, whether the Chooser accepted or rejected the proposal and the preferred outcome of that Chooser. On the right, you find a Graph where the most recent results are represented by blue squares. On the horizontal axis you can read the value of the suggestion and on the vertical axis the value of the corresponding proposal

DETAILED INSTRUCTIONS

Now we will describe the experiment in detail. At the start of the experiment you will receive a starting capital of 100 points. During the experiment you will be asked to make a number of decisions. Your decisions and the decisions of the participants you will be paired with will determine how much money you earn. The experiment consists of around 50 periods. In each period, your earnings will be denoted in points. Your final earnings in the experiment will be equal to the starting capital plus the sum of your earnings in all periods. At the end of the experiment, your earnings in points will be transferred to money. For each 100 points you earn, you will receive 1,5 (one-and-a-half) euro. Your earnings will be privately paid to you in cash.
In each period, all participants are paired in couples. One participant within a pair has the role of CHOOSER, the other participant performs the role of PROPOSER. In all periods you keep the same role.

Your role is: CHOOSER.

MATCHING PROCEDURE
For the duration of the experiment, you will be in a fixed matching group of five Proposers and five Choosers (hence 10 participants in total, including yourself). In each period you are randomly matched to another participant in this matching group with the role of Proposer. You will never learn with whom you are matched.

BARGAINING AND PREFERRED OUTCOMES
In each period, you and the Proposer with whom you are coupled will bargain over an outcome. The Proposer's preferred outcome is always 0. Your preferred outcome is a number between (and including) 0 and 120. Any number between 0 and 120 is equally likely. Each period you will receive a new preferred outcome that does not depend on your preferred outcome of any previous period. You are the only one who is informed about your preferred outcome. The Proposer only knows that your preferred outcome is a number between 0 and 120 (and that each such number is equally likely).

SEQUENCE OF EVENTS IN A PERIOD
After you have learned your preferred outcome in a period, you will send a SUGGESTION for a proposal to the Proposer. You may send any suggestion between (and including) 0 and 120. It is up to you to decide whether and how you let your suggestion depend on your preferred outcome. Then, the Proposer with whom you are coupled is informed of your suggestion (but not of your preferred outcome). Subsequently, the Proposer makes a PROPOSAL for the outcome. A proposal is any number between (and including) 0 and 120. Finally, you will choose to accept or reject the proposal.
At the end of a period, you are informed of the payoff (points you earned) that you made. This payoff is automatically added to your total earnings (or in case that you make a loss, it is subtracted from your total earnings). The Proposer is informed of the outcome, your preferred outcome and her or his own payoff.

Please note that the experiment will only continue from one phase to another after *everybody* has pressed OK/PROCEED. For this reason, please press OK/PROCEED as soon as you have made your decision.

PAYOFFS WHEN YOU ACCEPT THE PROPOSAL
When you accept the proposal, you will receive a payoff of 60 minus the distance between your preferred outcome and the proposal:

Your payoff = 60 – distance(your preferred outcome and proposal).

When you accept the proposal, the Proposer's payoff is 60 minus 0.4 times the proposal:

Payoff Proposer = 60 – 0.4 * proposal.

It is possible to reject a proposal.

PAYOFFS WHEN YOU REJECT THE PROPOSAL
When you reject a proposal, then the outcome is the status quo. In this case, you will receive 0 points and the Proposer will receive 0 points.
Notice that accepting an offer gives you a higher payoff than rejecting it if and only if the distance between the proposal and your preferred outcome is smaller than 60. The Proposer's payoff is higher when you accept than when you reject in all cases.

EXAMPLE 1. Suppose your preferred outcome is 80 and you receive a proposal of 100. Then, the distance between your preferred outcome and proposal is 100 - 80 = 20.
If you accept, your payoff is 60 - 20 = 40. The Proposer's payoff in this case is 60 – 0.4*100 = 20.
If you reject, your payoff is 0 and the Proposer's payoff is 0.

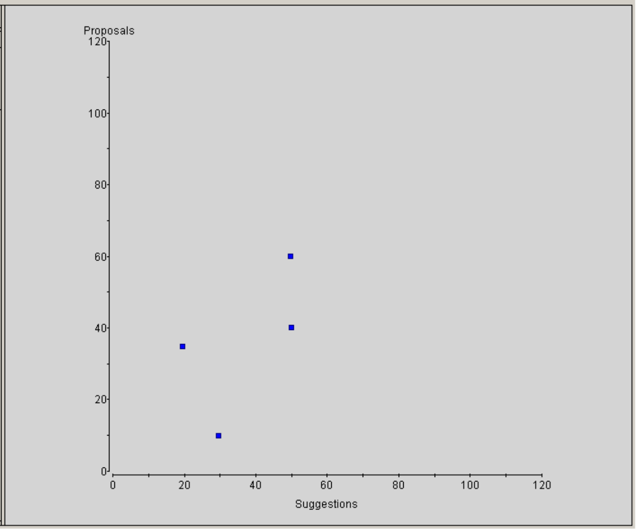
EXAMPLE 2. Suppose your preferred outcome is 80 and you receive a proposal of 10. Then, the distance between your preferred outcome and the proposal is 80 - 10 = 70.
If you accept, your payoff is 60 - 70 = -10. The Proposer's payoff in this case is 60 – 0.4*10 = 56.
If you reject, your payoff is 0 and the Proposer's payoff is 0.

HISTORY OVERVIEW
When making a decision, you may use the History Overview, which fills the lower part of the screen. The History Overview summarizes the results of the most recent 15 periods. (If less than 15 periods have been completed, this history overview contains results of all completed periods.)
Apart from your own results in the previous periods, the History Overview also contains the results of the other Chooser/Proposer pairs in your matching group. In total you are thus informed about the past results of the same matching group of five Chooser/Proposer pairs. All other Choosers and Proposers in your matching group will have the same information. The presentation of information for Proposers is different than for Choosers.

TABLE
Below you see an example of the history overview. THE NUMBERS IN THE HISTORY OVERVIEW DO NOT INDICATE WHAT YOU SHOULD DO IN THE EXPERIMENT. The left part of the history overview is a Table with four columns. The first column labelled SUGGESTION contains the suggestions made by the Choosers in the recent previous periods. The second column labelled PROPOSAL gives the proposal that was made by the Proposer as a response to the suggestion in the same row. The third column labelled ACCEPTANCE shows whether the Chooser accepted or rejected the proposal. The fourth column labelled PREFERRED OUTCOME shows the preferred outcome of the Chooser.

History (including your own pair)

Suggestion	Proposal	Acceptance	Preferred outcome
20	35	Yes	30
30	10	No	70
50	40	No	20
50	60	Yes	50



The results shown in the history overview will be sorted on the basis of suggestion in ascending order. (The lower the suggestion, the higher the place in the table.) When the suggestion is the same for two or more different results, these observations will be sorted on the basis of proposal, again in ascending order. In the example above, this applies to the third and the fourth row, where two Choosers chose the same suggestion but the corresponding Proposers chose different proposals. More generally, observations have been sorted first on suggestion, then on proposal, then on acceptance or rejection and finally on preferred outcome.

GRAPH

On the right of the history overview, the most recent results are represented in a graph. The horizontal axis presents the suggestion and the vertical axis presents the proposal. Each previous observation is represented by a blue square. On the horizontal axis you can read the value of the suggestion for a particular result and on the vertical axis you can read the value of the corresponding proposal. (Proposers will see preferred outcomes on the vertical axis, rather than proposals.)

EXAMPLE. Consider the square that is displayed in the lower left corner of the Graph shown above. Here, the Chooser made a suggestion of 30. The Proposer responded with a proposal of 10.

You have now reached the end of the instructions. The next page contains some questions concerning the experiment. When all participants have answered all questions correctly, we will proceed with the experiment.

QUESTIONS

Please answer the following questions. THE VALUES USED IN SOME QUESTIONS DO NOT INDICATE WHAT YOU SHOULD DO IN THE EXPERIMENT. RATHER, THEY HAVE BEEN CHOSEN TO FACILITATE CALCULATIONS.

1. Is the following statement correct? ‘In each period I am coupled with the same Proposer.’

2. Is the following statement correct? ‘My preferred position will be observed by the Proposer before (s)he makes her or his proposal.’

3.
(A) What is the highest value your preferred outcome can take on?
(B) What is the highest value a suggestion of yours can take on?
(C) What is the highest value a proposal can take on?

4. Consider a period in which your preferred outcome is 50. You chose to send a suggestion of 40. The Proposer made a proposal of 20, which was accepted by you.
(A) What are your own earnings in this period?
(B) How much does the Proposer to whom you are paired earn?

5. Consider a period in which your preferred outcome is 90. You chose to send a suggestion of 100. The Proposer made a proposal of 0, which was accepted by you.
(A) What are your own earnings in this period?
(B) How much does the Proposer to whom you are paired earn?

6. Consider a period in which your preferred outcome is 30. You chose to send a suggestion of 40. The Proposer made a proposal of 10, which was rejected by you.
(A) What are your own earnings in this period?
(B) How much does the Proposer to whom you are paired earn?

When you are ready answering the questions, please raise your hand.

Instructions Proposer

INSTRUCTIONS

Welcome to this decision-making experiment. Please read these instructions carefully. We will first provide you with an outline of the instructions and then we will proceed with a detailed description of the instructions.

OUTLINE

Experiment

- At the start of the experiment you will receive a starting capital of 100 points. In addition, you can earn points with your decisions.
- At the end of the experiment, you receive 1,5 (one-and-a-half) euro for each 100 points earned.
- The experiment consists of around 50 periods.
- Your role in the whole experiment is: **PROPOSER**.
- In each period, you will be randomly paired with a different participant who performs the role of Chooser.

Sequence of events

- In each period, you and the Chooser will bargain over an outcome, which can be any number between 0 and 120.
- Your preferred outcome is always 0.
- The Chooser's preferred outcome is a number between 0 and 120. Any number between 0 and 120 is equally likely.
- Each period, each Chooser will receive a new (random) preferred outcome. The Chooser is the only one who is informed about her or his preferred outcome.
- After learning her or his preferred outcome, the Chooser with whom you are matched will send a SUGGESTION for a proposal (between 0 and 120) to you.
- You are informed of the Chooser's suggestion and make a PROPOSAL (between 0 and 120) for the outcome.
- After the Chooser has been informed of the proposal, she or he accepts or rejects it.
- At the end of a period, you are informed of the points you earned (your payoff).

Payoffs

- When the Chooser accepts your proposal, your payoff is 60 minus 0.4 times the proposal.
- The Chooser's payoff is in this case 60 minus the distance between her or his preferred outcome and the proposal.
- When the Chooser rejects your proposal, you receive 0 points and the Chooser 0 points.

History Overview

When making a decision, you may use the History Overview, which provides an overview of the results of five Chooser/Proposer pairs (including your own pair) in the 15 most recent periods. The left part of the overview is a Table with four columns SUGGESTION, PREFERRED OUTCOME, PROPOSAL and ACCEPTANCE. In a row, you will find a particular pair's suggestion, the preferred outcome of the Chooser, the proposal made by the Proposer and whether the Chooser accepted or rejected the proposal. On the right, you find a Graph where the most recent results are represented by blue squares. On the horizontal axis you can read the value of the suggestion and on the vertical axis the value of the corresponding preferred outcome of the Chooser.

DETAILED INSTRUCTIONS

Now we will describe the experiment in detail. At the start of the experiment you will receive a starting capital of 100 points. During the experiment you will be asked to make a number of decisions. Your decisions and the decisions of the participants you will be paired with will determine how much money you earn. The experiment consists of around 50 periods. In each period, your earnings will be denoted in points. Your final earnings in the experiment will be equal to the starting capital plus the sum of your earnings in all periods. At the end of the experiment, your earnings in points will be transferred to money. For each 100 points you earn, you will receive 1,5 (one-and-a-half) euro. Your earnings will be privately paid to you in cash.
In each period, all participants are paired in couples. One participant within a pair has the role of CHOOSER, the other participant performs the role of PROPOSER. In all periods you keep the same role.

Your role is: PROPOSER.

MATCHING PROCEDURE
For the duration of the experiment, you will be in a fixed matching group of five Proposers and five Choosers (hence 10 participants in total, including yourself). In each period you are randomly matched to another participant with the role of Chooser. You will never learn with whom you are matched.

BARGAINING AND PREFERRED OUTCOMES
In each period, you and the Chooser with whom you are coupled will bargain over an outcome. Your preferred outcome is always 0. The Chooser’s preferred outcome is a number between (and including) 0 and 120. Any number between 0 and 120 is equally likely. Each period, each Chooser will receive a new preferred outcome that does not depend on a preferred outcome of any previous period. The Chooser is the only one who is informed about her or his preferred outcome. You only know that the Chooser’s preferred outcome is a number between 0 and 120 (and that each such number is equally likely).

SEQUENCE OF EVENTS IN A PERIOD
After the Chooser with whom you are matched has learned her or his preferred outcome in a period, she or he will send a SUGGESTION for a proposal to you. The Chooser may send any suggestion between (and including) 0 and 120. It is up to the Chooser to decide whether and how she or he lets her or his suggestion depend on her or his preferred outcome. Then, you are informed of the Chooser’s suggestion (but not of her or his preferred outcome). Subsequently, you make a PROPOSAL for the outcome. A proposal is any number between (and including) 0 and 120. Finally, the Chooser will choose to accept or reject the proposal.
At the end of a period, you are informed of the outcome of the period and the preferred outcome of the Chooser you were paired with. Finally, you are informed of the payoff (points you earned) that you made. This payoff is automatically added to your total earnings (or in case that you make a loss, it is subtracted from your total earnings).

Please note that the experiment will only continue from one phase to another after everybody has pressed OK/PROCEED. For this reason, please press OK/PROCEED as soon as you have made your decision.

PAYOFFS WHEN THE CHOOSER ACCEPTS THE PROPOSAL
When the Chooser accepts your proposal, your payoff is 60 minus 0.4 times the proposal:

Your payoff = 60 – 0.4 * proposal.

When the Chooser accepts your proposal, the Chooser will receive a payoff of 60 minus the distance between her or his preferred outcome and the proposal:

Payoff Chooser = 60 – distance(her or his preferred outcome and proposal).

It is possible for a Chooser to reject a proposal.

PAYOFFS WHEN THE CHOOSER REJECTS THE PROPOSAL
When the Chooser rejects a proposal, then the outcome is the status quo. In this case, you will receive 0 points and the Chooser will receive 0 points.

Notice that accepting an offer gives the Chooser a higher payoff than rejecting it if and only if the distance between the proposal and her preferred outcome is smaller than 60. Your payoff is higher when the Chooser accepts than when she or he rejects in all cases.

EXAMPLE 1. Suppose the Chooser's preferred outcome turns out to be 80 (which you cannot know) and you make a proposal of 100. Then, the distance between her preferred outcome and your proposal is 100 - 80 = 20.
If the Chooser accepts, your payoff is 60 – 0.4*100 = 20. The Chooser's payoff in this case is 60 - 20 = 40.
If the Chooser rejects, your payoff is 0 and the Chooser's payoff is 0.

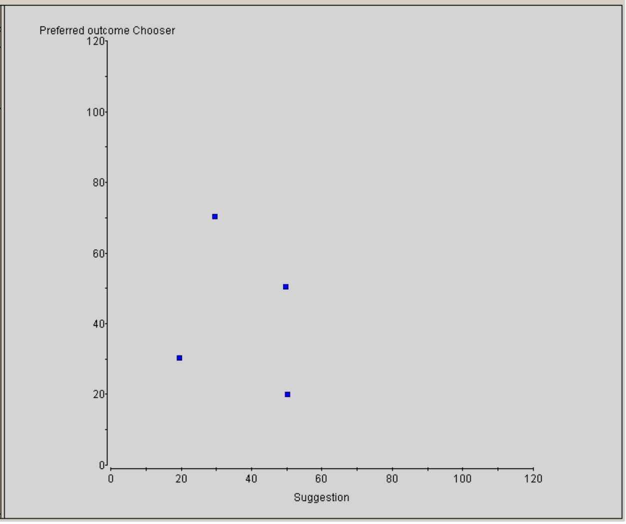
EXAMPLE 2. Suppose the Chooser's preferred outcome turns out to be 80 and you make a proposal of 10. Then, the distance between her preferred outcome and your proposal is 80 - 10 = 70.
If the Chooser accepts, your payoff is 60 – 0.4*10 = 56. The Chooser's payoff in this case is 60 - 70 = -10.
If the Chooser rejects, your payoff is 0 and the Chooser's payoff is 0.

HISTORY OVERVIEW
When making a decision, you may use the History Overview, which fills the lower part of the screen. The History Overview summarizes the results of the most recent 15 periods. (If less than 15 periods have been completed, this history overview contains results of all completed periods.)
Apart from your own results in the previous periods, the history overview also contains the results of the other Chooser/Proposer pairs in your matching group. In total you are thus informed about the past results of the same group of five Chooser/Proposer pairs. All Choosers and Proposers in your matching group will have the same information. The presentation of information is different for Choosers than for Proposers.

TABLE
Below you see an example of the history overview. THE NUMBERS IN THE HISTORY OVERVIEW DO NOT INDICATE WHAT YOU SHOULD DO IN THE EXPERIMENT. The left part of the history overview is a Table with four columns. The first column labelled SUGGESTION contains the suggestions made by the Choosers in the recent previous periods. The second column labelled PREFERRED OUTCOME shows the preferred outcome of the Chooser. The third column labelled PROPOSAL gives the proposal that was made by the Proposer as a response to the suggestion in the same row. The fourth column labelled ACCEPTANCE shows whether the Chooser accepted or rejected the proposal.

History (including your own pair)

Suggestion	Preferred outcome	Proposal	Acceptance
20	30	35	Yes
30	70	10	No
50	20	40	No
50	50	60	Yes



The results shown in the history overview will be sorted on the basis of suggestion in ascending order. (The lower the suggestion, the higher the place in the table.) When the suggestion is the same for two or more different results, these observations will be sorted on the basis of preferred outcome, again in ascending order. In the example above, this applies to the third and the fourth row, where two Choosers chose the same suggestion but had different preferred outcomes. More generally, observations have been sorted first on suggestion, then on preferred outcome, then on proposal and finally on acceptance or rejection.

GRAPH

On the right of the history overview, the most recent results are represented in a graph. The horizontal axis presents the suggestion and the vertical axis presents the proposal. Each previous observation is represented by a square. On the horizontal axis you can read the value of the suggestion for a particular result and on the vertical axis you can read the value of the corresponding proposal. If the square is green, the particular proposal was accepted and if the square is red with white inside, the particular proposal was rejected. (Choosers will see proposals on the vertical axis.)

EXAMPLE 1. Consider the square that is displayed in the lower left corner of the Graph shown above. Here, the Chooser made a suggestion of 20. This Chooser's preferred outcome was 30.

You have now reached the end of the instructions. The next page contains some questions concerning the experiment. When all participants have answered all questions correctly, we will proceed with the experiment.

QUESTIONS

Please answer the following questions. THE VALUES USED IN SOME QUESTIONS DO NOT INDICATE WHAT YOU SHOULD DO IN THE EXPERIMENT. RATHER, THEY HAVE BEEN CHOSEN TO FACILITATE CALCULATIONS.

1. Is the following statement correct? ‘In each period I am coupled with the same Chooser.’

2. Is the following statement correct? ‘I will observe the Chooser’s preferred position before I make my proposal.’

3.
(A) What is the highest value the preferred outcome of a Chooser can take on?
(B) What is the highest value a suggestion of a Chooser can take on?
(C) What is the highest value a proposal of yours can take on?

4. Consider a period in which the Chooser’s preferred outcome is 50. The Chooser chose to send a suggestion of 40. You made a proposal of 20, which was accepted by the Chooser.
(A) What are your own earnings in this period?
(B) How much does the Chooser to whom you are paired earn?

5. Consider a period in which the Chooser’s preferred outcome is 90. The Chooser chose to send a suggestion of 100. You made a proposal of 0, which was accepted by the Chooser.
(A) What are your own earnings in this period?
(B) How much does the Chooser to whom you are paired earn?

6. Consider a period in which the Chooser’s preferred outcome is 30. The Chooser chose to send a suggestion of 40. You made a proposal of 10, which was rejected by the Chooser.
(A) What are your own earnings in this period?
(B) How much does the Chooser to whom you are paired earn?

When you are ready answering the questions, please raise your hand.