Appendix

Table of Contents

A Theoretical Appendix

Model

There are $N \geq 3$ group members, consisting of players A_1, ... A_{N-1} and a player $B \equiv A_N$, and a group-external evaluator E. The group members make a binary choice between two options X and Y. All players prefer one of the options. The group members derive a utility $\tau_i > 0, i \in \{1, ...N\}$ if they choose the option that corresponds to their own taste. The evaluators are not modeled based on maximizing utility. They just implement a decision rule. We assume that the players' preferences are correlated in the following way. There is a generally preferred option. The probability for each specific option to be generally preferred is $\frac{1}{2}$. Each player independently prefers this option with probability $p > \frac{1}{2}$.[1] A high probability p means that the preferences in the population of players are similar. A low probability p, i.e. a probability close to $\frac{1}{2}$, means that the preferences in the population of players are mixed.

First, the A players (i.e. players A_1, ... A_{N-1}) decide. They make their choices simultaneously. Player B chooses after observing the choices of the A players. The evaluator E selects one of the N group members without being informed of who player B is. In the punishment treatment, the selected player receives a monetary deduction of m. In the reward treatment, the selected player receives a monetary payment of m.

The utility of the players A and B consists of the utility from the money m if they are selected, and of the utility τ_i if they choose the option that corresponds to their taste. We assume that the components are additive and that τ_i is expressed in monetary terms. So,

[1] This means that the probability that two players prefer the same option equals $\sigma = p^2 + (1-p)^2$. Conversely, we can calculate p based on σ: $p = \frac{1}{2} + \frac{1}{2}\sqrt{2\sigma - 1}$.

the utility equals $M + \tau_i$, where $M = 0$ if the player is not selected, $M = m$ if the player is rewarded, and $M = -m$ if the player is punished. The cumulative distribution function T of τ_i is common knowledge, and we assume that it is continuous and strictly increasing between 0 and a value τ_{max}.

The evaluator decides according to a rule. The salience-based rule means that he selects someone from the minority if there is one. Otherwise he chooses a player randomly. The homophily-based rule means that, if possible, the evaluator rewards someone who has chosen in accordance with the evaluator's own taste and punishes someone who has chosen against the evaluator's taste.

We describe the equilibria for the case of $N = 3$. We give some insights on the general case of $N > 3$ in Appendix A.4. The A players have two strategies: following their own taste and switching (i.e., choosing opposite to their own taste). Since player B is not informed about the identity of the A players, B can only condition on the number of A players who decide according to B's taste. Thus, player B has eight pure strategies. We describe the situation that B is in relative to the taste of B. We write that a player A *agrees with* B if A chooses according to B's taste and that a player A *disagrees with* B if A chooses against B's taste.

A.1 Responses to evaluation based on salience

PROPOSITION 1 (Salience-based punishment). The A players follow their own taste. If the A players both disagree with B then B chooses as the A players if $\frac{\tau_B}{m} < \frac{2}{3}$, and B is indifferent if $\frac{\tau_B}{m} = \frac{2}{3}$. In all other cases, B follows his own taste.

Proposition 2 (Salience-based reward). There is a unique symmetric equilibrium, which is characterized as follows. The A players choose according to their own taste if $\frac{\tau_A}{m} > K$ where K is a constant that depends on T, and p. They choose against their preferred taste if $\frac{\tau_A}{m} < K$, and are indifferent if $\frac{\tau_A}{m} = K$. If the A players both agree with B then B chooses contrary to the A players if $\frac{\tau_B}{m} < \frac{2}{3}$, and is indifferent if $\frac{\tau_B}{m} = \frac{2}{3}$. In all other cases, B chooses according to his own taste.

The optimal behavior of player B follows directly from the definition of salience-based evaluation. B tries to coordinate in the case of punishmetn and dis-coordinate in the case of reward. Concerning the behavior of A, it is intuitively clear that if there is an incentive for conformity, then also the A players should try to coordinate, which they best achieve by following their own taste. Salience-based reward creates an incentive to dis-coordinate. If τ_A is small enough, the A players have an incentive to deviate from their own taste in order to make it more difficult for B to stand out.

Proof. First, we study the behavior of player B. If the A players disagree then B will not be punished independent of the own choice because there is always an A player who is salient. Thus, B follows the own taste. If B agrees with both A players, then B has no incentive not to follow the own taste. Deviating from the own taste would increase the punishment probability from $\frac{1}{3}$ to 1. If B disagrees with both A players, then following the own taste provides a utility of $\tau_B - m$ and adjusting to the choice of the A players provides a utility of $-\frac{m}{3}$. Thus, B strictly prefers the own taste if $\tau_B - m > -\frac{m}{3} \Leftrightarrow \frac{\tau_B}{m} > \frac{2}{3}$.

Without loss of generality, we can use A_1 in order to study the behavior of the A players. We show that A_1 has a lower probability to be punished by following the own taste, independent of the strategies of A_2 and B. In Table A1, we show the punishment probability for A_1 for the strategies F =follow the own taste, S =switch to non-favorite taste, C =conformity (only possible for B), i.e. adjust to As if they agree. For convenience, we define $q = 1 - p$.

Table A1. *Punishment probabilities based on salience*

A_1				F	S	F	S	F	S	F	S
A_2				F	F	S	S	F	F	S	S
B				F	F	F	F	C	C	C	C
A_1	A_2	B	Probability								
X	X	X	p^3	$\frac{1}{3}$	1	0	0	$\frac{1}{3}$	1	0	$\frac{1}{3}$
X	X	Y	p^2q	0	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	1	$\frac{1}{3}$
X	Y	X	p^2q	0	0	$\frac{1}{3}$	1	0	$\frac{1}{3}$	$\frac{1}{3}$	1
Y	X	X	p^2q	1	$\frac{1}{3}$	0	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
X	Y	Y	pq^2	1	$\frac{1}{3}$	0	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
Y	X	Y	pq^2	0	0	$\frac{1}{3}$	1	0	$\frac{1}{3}$	$\frac{1}{3}$	1
Y	Y	X	pq^2	0	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	1	$\frac{1}{3}$
Y	Y	Y	q^3	$\frac{1}{3}$	1	0	0	$\frac{1}{3}$	1	0	$\frac{1}{3}$

Punishment probabilities for A_1 depending on the preferred options (X vs. Y) and strategies (F, S or C).

The difference of the probability to be punished when switching vs. when not provides the following expressions:

$$p^3(1-\frac{1}{3}) + p^2q(\frac{1}{3}-1) + pq^2(\frac{1}{3}-1) + q^3(1-\frac{1}{3}) = \frac{2}{3}(p^2-q^2)(p-q) > 0$$

$$p^2q(\frac{4}{3}-\frac{4}{3}) + pq^2(\frac{4}{3}-\frac{4}{3}) = 0$$

$$p^3(1-\frac{1}{3}) + p^2q(-\frac{1}{3}+\frac{1}{3}+\frac{1}{3}-1) + pq^2(\frac{1}{3}-1+\frac{1}{3}-\frac{1}{3}) + q^3(1-\frac{1}{3}) = \frac{2}{3}(p^2-q^2)(p-q) > 0$$

$$p^3(\frac{1}{3}) + p^2q(\frac{1}{3}-1+1-\frac{1}{3}-\frac{1}{3}) + pq^2(-\frac{1}{3}+1-\frac{1}{3}+\frac{1}{3}-1) + q^3(\frac{1}{3}) = \frac{1}{3}(p^2-q^2)(p-q) > 0$$

Table A2. *Reward probabilities based on salience*

A_1				F	S	F	S
A_2				F	F	S	S
A_1	A_2	B	Probability				
X	X	X	p^3	$\frac{\varphi}{3}$	1	0	0
X	X	Y	p^2q	0	0	1	$\frac{\varphi}{3}$
X	Y	X	p^2q	0	0	$\frac{\varphi}{3}$	1
Y	X	X	p^2q	1	$\frac{\varphi}{3}$	0	0
X	Y	Y	pq^2	1	$\frac{\varphi}{3}$	0	0
Y	X	Y	pq^2	0	0	$\frac{\varphi}{3}$	1
Y	Y	X	pq^2	0	0	1	$\frac{\varphi}{3}$
Y	Y	Y	q^3	$\frac{\varphi}{3}$	1	0	0

Reward probabilities for A_1 depending on the preferred options (X vs. Y) and strategies (F, S or C).

All expressions are weakly positive. Since we assumed that $\tau_{A_1} > 0$, A_1 has a strict incentive to follow the own taste. □

Proof salience-based reward. First, we study the behavior of player B. If the A players disagree then B will not be rewarded independent of his own choice. Thus, B follows the own taste. If B disagrees with both A players, then B follows his own taste. Deviating from the own taste would decrease the reward probability from 1 to $\frac{1}{3}$. If B agrees with both A players, then following his own taste provides a utility of $\tau_B + \frac{m}{3}$ and switching to the choice not made by the A players provides a utility of m. Thus, B strictly prefers the own taste if $\tau_B + \frac{m}{3} > m \Leftrightarrow \frac{\tau_B}{m} > \frac{2}{3}$.

Let us now turn to the incentives for player A_1. Let φ be the share of the player B who follows the own taste, i.e. the players with $\tau_B > \frac{2}{3}m$. Since T is strictly increasing φ is well defined. We now determine the probability γ_i that A_i chooses according to the own taste.

We show the reward probabilities of A_1 in Table A1. Again, we define $q = 1 - p$.

The difference of the reward probability between when A_1 follows the own taste and when it does not equals

$$p^3\gamma_2(\frac{\varphi}{3}-1)+p^2q\gamma_2(1-\frac{\varphi}{3})+pq^2\gamma_2(1-\frac{\varphi}{3})+q^3\gamma_2(\frac{\varphi}{3}-1)=$$
$$-(1-\frac{\varphi}{3})\gamma_2(p^3-p^2q-pq^2+q^3)=$$
$$-(1-\frac{\varphi}{3})\gamma_2(p-q)^2$$

Thus, A_1 follows the own taste if $\tau > \gamma_2 m(1-\frac{\varphi}{3})(p-q)^2$. Let τ_{crit} be the threshold above which the A player follow their own taste. Then the share of players who follow the own taste equals $1-T(\tau_{crit})$ and we get the following equation.

$$\gamma_1 = 1 - T(\gamma_2 m(1-\frac{\varphi}{3})(2p-1)^2)$$

If we set $\gamma_1 = \gamma_2 =: \gamma$, we get a unique solution for γ because we assumed T to be continuous. The share γ decreases in m and in p. If T shifts to the left (people care less about the own taste), then γ decreases. This is the case because the direct effect and the indirect effect via φ go into the same direction. $\square$

There can be asymmetic equilibria, also if the distribution is uniform. Assume, that T is uniformly distributed between 1 and $\frac{1}{\sigma}$, i.e. $T(\gamma)=\sigma\gamma$. $K := m(1-\frac{\varphi}{3}(2p-1)^2$. Then

$$\gamma_1 = 1 - \sigma K \gamma_2$$

$$\gamma_2 = 1 - \sigma K \gamma_1$$

$$\gamma_1 = 1 - \sigma K(1 - \sigma K \gamma_1)$$

$$\gamma_1(1 - (\sigma K)^2) = 1 - \sigma K$$

If $\sigma K = 1$ then any combination with $\gamma_1 + \gamma_2 = 1$ is an equilibrium. Otherwise, there is only the symmetric equilibrium with $\gamma_1 = \gamma_2 = \frac{1}{1+\sigma K}$.

A.2 Responses to evaluation based on homophily

We start with some terminology on player B's decision: It is called *independent* if it coincides with player B's own taste. It is called *conformist* if, in case of disagreement with the A players, B neglects his own taste and follows the choice of the majority. It is called *anticonformist* if, in case of agreement with both A players, B neglects his own taste and makes a minority choice.

Proposition 3 (Homophily-based punishment). Independent of the strategy of player B, the A players always follow their own taste. B is conformist if $\frac{\tau_B}{m} < (2(p - \frac{1}{2})^2 + \frac{1}{6})$, otherwise B is independent. (In case of equality B is indifferent between conformity and independence.)

Proposition 4 (Homophily-based reward). Independent of the strategy of player B, the A players always follow their own taste. B is conformist if $\frac{\tau_B}{m} < (\frac{1}{3} - 2p(1 - p))$. B

is anticonformist if $\frac{\tau_B}{m} < (\frac{2}{3} - \frac{p^4+(1-p)^4}{p^3+(1-p)^3})$. (In case of equality B is indifferent between conformity or anticonformity and independence.)

Proof. We first show that A_1 has an incentive to follow the own taste independent of the strategies of A_2 and B, and in both the reward and the punishment setting. To do this, we setup Table tab:homophily-punishment. It contains the difference between the probability that A_1 gets punished when switching compared to following the own taste. A positive entry corresponds to an incentive to follow the own taste. For all combinations of strategies of B and A_2, this difference is a homogeneous polynomial in p and $q = 1 - p$ of grade 4. The coefficients of these polynomials can be found in the rows $M40$ to $M04$.

Table A3. *Punishment probability differences based on homophily*

				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
			*A*_2	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S
			B0	F	F	F	F	F	F	F	F	S	S	S	S	S	S	S	S
			B1	F	F	F	F	S	S	S	S	F	F	F	F	S	S	S	S
			B2	F	F	S	S	F	F	S	S	F	F	S	S	F	F	S	S
Eval	*A*_1	*A*_2	*B*																
X	X	X	X	$\frac{2}{3}$	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{3}$
X	X	X	Y	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	1	$\frac{1}{3}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{2}$
X	X	Y	X	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$
X	Y	X	X	$-\frac{2}{3}$	$-\frac{1}{2}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{3}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{3}$
Y	X	X	X	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{3}$	-1	$-\frac{1}{2}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{2}$	$-\frac{2}{3}$
X	X	Y	Y	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	1	$\frac{1}{2}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{2}{3}$
X	Y	X	Y	$-\frac{1}{2}$	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{2}$	-1	$-\frac{1}{3}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{2}$
X	Y	Y	X	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{2}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{3}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{2}$
Y	X	X	Y	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{2}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{3}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{2}$
Y	X	Y	X	$-\frac{1}{2}$	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{2}$	-1	$-\frac{1}{3}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{2}$
Y	Y	X	X	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	1	$\frac{1}{2}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{2}{3}$
X	Y	Y	Y	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{3}$	-1	$-\frac{1}{2}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{2}$	$-\frac{2}{3}$
Y	X	Y	Y	$-\frac{2}{3}$	$-\frac{1}{2}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{3}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{3}$
Y	Y	X	Y	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$
Y	Y	Y	X	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	1	$\frac{1}{3}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{2}$
Y	Y	Y	Y	$\frac{2}{3}$	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{3}$
			M40	$\frac{2}{3}$	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{3}$
			M31	0	0	$-\frac{1}{2}$	$\frac{1}{2}$	1	-1	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	-1	1	$\frac{1}{2}$	$-\frac{1}{2}$	0	0
			M22	$-1\frac{1}{3}$	-1	-1	-2	$-2\frac{1}{3}$	1	-2	0	$-\frac{1}{3}$	$-1\frac{2}{3}$	0	$-2\frac{2}{3}$	$-1\frac{1}{3}$	$\frac{1}{3}$	-1	$-\frac{2}{3}$
			M13	0	0	$-\frac{1}{2}$	$\frac{1}{2}$	1	-1	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	-1	1	$\frac{1}{2}$	$-\frac{1}{2}$	0	0
			M04	$\frac{2}{3}$	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{3}$

Probability differences between switching and following for player A_1 for all strategies of player A_2 and B. Positive values means that switching increases the punishment probability. The columns starting with Mxy contain the coefficient of the monomial $p^x(1-p)^y$.

It can be shown that all these polynomials are positive. Note that all polynomials are symmetric in the sense that the coefficient of $p^k q^{1-k}$ equals the coefficient of $p^{1-k}q^k$. Most of the terms have the form $p^k q^{1-k} - p^r q^{1-r} - p^{1-r}q^r + p^{1-k}q^k$ with $k > r \geq 2$. In this case, we get

$$\begin{aligned} p^k q^{1-k} - p^r q^{1-r} - p^{1-r} q^r + p^{1-k} q^k &= \\ p^r q^{1-k}(p^{k-r} - q^{k-r}) - p^{1-k} q^r (p^{k-r} - q^{k-r}) &= \\ (p^r q^{1-k} - p^{1-k} q^r)(p^{k-r} - q^{k-r}) &> 0 \end{aligned}$$

This argument works for column 1, 2, 8, 11, 15, and 16. In columns 3, 4, 5, 7, 9 10,12, and 13 the polynomials can be composed into the sum of two polynomials of this form. For example, polynomial 3 can be decomposed as follows:

$$\begin{aligned} & p^4 q^0 - \frac{1}{2}p^3 q^2 - p^2 q^2 - \frac{1}{2}p^1 q^3 + p^0 q^4 = \\ & \qquad \frac{1}{2}(p^4 q^0 - p^3 q^1 - p^1 q^3 + p^0 q^4) + \frac{1}{2}(p^4 q^0 - p^2 q^2 - p^2 q^2 + p^0 q^4) \end{aligned}$$

For columns 6 and 14, we need a calculation as the following illustrating the case 6:

$$\begin{aligned} \frac{1}{2}p^4 - p^3 q + p^2 q^2 - p q^3 + \frac{1}{2}q^4 &= \\ \frac{1}{4}(p-q)^4 + \frac{1}{4}p^4 - (\frac{6}{4} - 1)p^2 q^2 + \frac{1}{4}q^4 &= \\ -\frac{1}{4}(p-q)^4 + \frac{1}{4}(p^2 - q^2)^2 &< 0 \end{aligned}$$

Table A4 shows the corresponding table for reward. In this table we show the difference in the reward probability between following and switching. Thus also in this case, positive coefficients support following the own taste. The arguments why the polynomials are positive are analogous to the arguments in the punishment case. Thus, the A players have a monetary incentive to follow their taste, in addition to their direct incentive τ_i.

Table A4. *Reward probability differences based on homophily*

			A_2	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S
			B0	F	F	F	F	F	F	F	F	S	S	S	S	S	S	S	S
			B1	F	F	F	F	S	S	S	S	F	F	F	F	S	S	S	S
			B2	F	F	S	S	F	F	S	S	F	F	S	S	F	F	S	S
Eval	A_1	A_2	B																
X	X	X	X	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	1	$\frac{1}{2}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{2}{3}$
X	X	X	Y	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$
X	X	Y	X	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	1	$\frac{1}{3}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{2}$
X	Y	X	X	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{3}$	-1	$-\frac{1}{2}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{2}$	$-\frac{2}{3}$
Y	X	X	X	$-\frac{2}{3}$	$-\frac{1}{2}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{3}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{3}$
X	X	Y	Y	$\frac{2}{3}$	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{3}$
X	Y	X	Y	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{2}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{3}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{2}$
X	Y	Y	X	$-\frac{1}{2}$	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{2}$	-1	$-\frac{1}{3}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{2}$
Y	X	X	Y	$-\frac{1}{2}$	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{2}$	-1	$-\frac{1}{3}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{2}$
Y	X	Y	X	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{2}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{3}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{2}$
Y	Y	X	X	$\frac{2}{3}$	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{3}$
X	Y	Y	Y	$-\frac{2}{3}$	$-\frac{1}{2}$	-1	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{2}{3}$	$-\frac{1}{3}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{3}$
Y	X	Y	Y	$-\frac{1}{3}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{3}$	-1	$-\frac{1}{2}$	-1	$-\frac{1}{3}$	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{2}{3}$	$-\frac{1}{2}$	$-\frac{2}{3}$
Y	Y	X	Y	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	1	$\frac{1}{3}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{2}$
Y	Y	Y	X	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$
Y	Y	Y	Y	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	1	$\frac{1}{2}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{2}{3}$
			M40	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	1	$\frac{1}{2}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{2}{3}$
			M31	0	0	$-\frac{1}{2}$	$\frac{1}{2}$	1	-1	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	-1	1	$\frac{1}{2}$	$-\frac{1}{2}$	0	0
			M22	$-\frac{2}{3}$	-1	0	-2	$-2\frac{2}{3}$	0	-2	-1	$\frac{1}{3}$	$-1\frac{1}{3}$	1	$-2\frac{1}{3}$	$-1\frac{2}{3}$	$-\frac{1}{3}$	-1	$-1\frac{1}{3}$
			M13	0	0	$-\frac{1}{2}$	$\frac{1}{2}$	1	-1	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	-1	1	$\frac{1}{2}$	$-\frac{1}{2}$	0	0
			M04	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	1	$\frac{1}{2}$	1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{2}{3}$

Probability differences between following and switching for player A_1 for all strategies of player A_2 and B. Positive values means that following increases the reward probability. The columns starting with Mxy contain the coefficient of the monomial $p^x(1-p)^y$.

Now, we determine the strategies for player B.

Punishment case. If B does not disagree with both A players it is best to follow the own taste. So, the only relevant case is that B disagrees with both As. In this case, the probability that B prefers the same option as the evaluator equals $\frac{2p^2q^2}{p^3q+2p^2q^2+pq^3} = 2pq$. Thus, following the own taste provides a utility of $\tau_B - (1-2p(1-p))m$. Switching the choice provides a utility of $-\frac{m}{3}$. Thus, B is conform if $\tau_B < m(1-2p(1-p)-\frac{1}{3})$.

Reward case. If the A players disagree, there is no reason for B to deviate from the own taste. The probability that the evaluator has the same taste as B is at least $\frac{1}{2}$ and if B chooses according to the taste of the evaluator, the winning probability is $\frac{1}{2}$ independent of the choice. If B disagrees with both As then the probability that B prefers the same option as the evaluator equals $2p(1-p)$ (as above). Thus, B is conform if $\frac{m}{3} > \tau_B + 2p(1-p)m \Leftrightarrow \tau_B < m(\frac{1}{3} - 2p(1-p))$. If B agrees with the As then the probability that B prefers the same option as the evaluator equals $\frac{p^4+(1-p)^4}{p^4+p^3(1-p)+p(1-p)^3+(1-p)^4} = \frac{p^4+(1-p)^4}{p^3+(1-p)^3}$. Thus, B is anticonform if $m(1-\frac{p^4+(1-p)^4}{p^3+(1-p)^3}) > \tau_B + m\frac{1}{3} \Leftrightarrow \tau_B < m(\frac{2}{3} - \frac{p^4+(1-p)^4}{p^3+(1-p)^3})$. □

A.3 Responses to evaluations based on performance

The generally preferred option may also be interpreted as the correct option, in particular in the domain of objective facts. In this case, evaluators could potentially reward and punish based on performance, i.e., they could punish someone who took a decision that is probably wrong and reward a choice that is probably true. This relates to the information cascade literature (Banerjee, 1992; Bikhchandani *et al.*, 1992; Anderson and Holt, 1997), but the relation is not very tight because only player B can be part of a cascade.[2]

[2]Our setting specifically relates to Guarino *et al.* (2011). They do not provide information on the choice sequence, which is comparable to our situation where the evaluator remains uninformed of who the B player

Interestingly, there are also equilibria in which "wrong signals" are sent. For example, if the evaluator favors the minority (punishes one of the majority or rewards the minority player), then the A players may have an incentive to choose the option they do not prefer. Because in this case the majority is not evidence for the better option, this can be an equilibrium. We present the equilibria in which the A players choose according the own taste. They always exist. We get the following propositions for the punishment treatment.

PROPOSITION 5 (Performance-based punishment). The equilibria in which the A players choose according to their taste can be described with the parameter $\eta \in [0, 1]$. The evaluator has a real choice only when the three group members disagree and a majority (two players) chooses one option and the minority (one player) chooses the other. If the group members disagree in their choice and the evaluator's taste matches the majority choice, then the evaluator punishes the minority player. If the group members disagree in their choice and the evaluator's taste contradicts the majority choice then the evaluator punishes one of the majority players with probability η and otherwise the minority player. B is conformist if $\frac{\tau_B}{m} > \frac{1}{3}(1 - p^2 - q^2) - 2p^2q^2(1 - \eta)$, otherwise B is independent. (In case of equality B is indifferent between conformity and independence.)

Proof. If the A players choose according their own taste, then the majority choice is at least as informative as the own taste of the evaluator. Accordingly, if the evaluator has the same taste as the majority, he will punish the minority. Thus, for B, anticonformity does not make sense because B will be punished with a probability of at least $\frac{1}{2}$ Let κ be the share of B who conform. Then the probability that the majority is correct equals

is who could condition the choice. However, their setting differs in that the information is not symmetric in the options.

$$\frac{(1-\kappa)p^2q + 2p^2q}{(1-\kappa)p^2q + 2p^2q + 2p^2q + (1-\kappa)pq^2} =$$
$$\frac{(kappa)p^2q}{(3-\kappa)p^2q + (3-\kappa)pq^2} =$$
$$\frac{p}{p+q} = p$$

Thus, independent of the conformity of player B, the evaluator chooses with the majority when he agrees with it and is indifferent otherwise.

If B always follows the own taste the punishment probability of B equals $\frac{1}{3}$ because in this case all three players have the same strategy. If B is conform then the punishment probability of B equals $\frac{1}{3}(p^3+p^2q)+p^2q^2(1-\eta)+p^2q^2(1-\eta)+\frac{1}{3}(pq^2+q^3) = \frac{1}{3}(p^2+q^2)+2p^2q^2(1-\eta) \leq \frac{1}{3}$.

The difference of the punishing probability of B between when B follows the own taste and when B is conform equals $\frac{1}{3}-\frac{1}{3}(p^2+q^2)+2p^2q^2(1-\eta) = \frac{1}{3}(1-p^2-q^2)-2p^2q^2(1-\eta) > 0$. Thus, B follows the own taste if $\frac{\tau_B}{m} > \frac{1}{3}(1-p^2-q^2) - 2p^2q^2(1-\eta)$.

It remains to be shown that following the own taste is an equilibrium for the A players. When facing different decisions of the A players, player B cannot affect the probability of reward because he will be in the majority anyhow. Thus, player B chooses according to the own taste because $\tau > 0$. We show that A_1 has an incentive to follow the own taste if the evaluator chooses according to the own taste or according to the majority, and if B does not choose against his taste when the A players disagree in their choice. If the evaluator follows the own taste, this has been shown in Table A3 above. If the evaluator goes with the majority (and punishes the minority), we get the polynomials $\frac{2}{3}p^4 - 1\frac{1}{3}p^2q^2 + \frac{2}{3}q^4$, $p^4 - 2p^2q^2 + q^4$, $\frac{2}{3}p^4 - 1\frac{1}{3}^2q^2 + \frac{2}{3}q^4$, and $p^4 - 2p^2q^2 + q^4$ for when B follows the own taste, is disconform,

conform and does not choose according to the own taste when the A players agree in their choice. These polynomials are positive. $\square$

For the reward treatment, we get the following propositions.

Proposition 6 (Performance-based reward). The equilibria in which the A players choose according to their taste can be described by the parameter $\eta \in [0, \frac{1}{3pq} - (p^2 + q^2)]$. The evaluator has a real choice only when the three group members disagree and a majority (two players) chooses one option and the minority (one player) chooses the other. If the group members disagree in their choice and the evaluator's taste matches the majority choice, then the evaluator rewards one of the majority players. If the group members disagree in their choice and the evaluator's taste contradicts the majority choice, then the evaluator rewards one of the minority player with probability η and otherwise one of the majority player. The A players always follow their taste. B is conformist if $\frac{\tau_B}{m} > \frac{1}{3}(p^2+q^2)+(p^3q+pq^3)(1-\eta)-\frac{1}{3}$, otherwise B is independent. (In case of equality B is indifferent between conformity or anticonformity and independence.)

Proof. Let κ be the share of Bs who conform and α be the share of Bs who anticonform. Then, the probability that the majority is correct equals

$$\frac{\alpha p^3 + (1-\kappa)p^2 q + 2p^2 q}{\alpha p^3 + (1-\kappa)p^2 q + 2p^2 q + 2p^2 q + (1-\kappa)pq^2 + \alpha q^3} =$$
$$\frac{\alpha p^3 + (3-\kappa)p^2 q}{\alpha p^3 + (kappa)p^2 q + (3-\kappa)pq^2 + \alpha q^3} \geq$$
$$\frac{\alpha p^3 + (3-\kappa)p^2 q}{\alpha p^3 + (3-\kappa)p^2 q + (3-\kappa)p^2 q + \alpha pq^2} =$$
$$\frac{p^2}{p^2 + pq} = p$$

Equality holds if $\alpha = 0$. If there is anticonformity, then the evaluator has a strict incentive to reward someone of the majority. However, in this case anticonformity prevents from getting the reward and will not be applied. Thus, there is no equilibrium with anticonformity.

If B always follows the own taste, the reward probability of B equals $\frac{1}{3}$ because in this case all three players have the same strategy. If B is anticonform then the reward probability of B equals $p^3 q\eta + p^2 q^2 \eta + p^3 q + pq^3 + p^2 q^2 \eta + pq^3 \eta$. This expression is larger than $\frac{1}{3}$ if $\eta > \frac{\frac{1}{3} - p^3 q - pq^3}{p^3 q + 2p^2 q^2 + pq^3} = \frac{1}{3pq} - (p^2 + q^2)$. Thus, an equilibrium exists only if $\eta \leq \frac{1}{3pq} - (p^2 + q^2)$.

If B conforms then the reward probability of B equals $\frac{1}{3}(p^3 + p^2 q) + p^3 q(1-\eta) + pq^3(1-\eta) + \frac{1}{3}(pq^2 + q^3) = \frac{1}{3}(p^2 + q^2) + (p^3 q + pq^3)(1-\eta)$. Thus, B is conform if $\frac{\tau_B}{m} > \frac{1}{3}(p^2 + q^2) + (p^3 q + pq^3)(1-\eta) - \frac{1}{3}$.

The proof that following the own taste is an equilibrium for the A players is done as in the prove above. □

A.4 Larger groups

In an earlier version of this paper, we analyzed equilibria for the case $N > 3$ but with monetary incentive only. The results are comparable. There is conformity in the punishment treatment for salience-based punishment as well as for homophily-based punishment. In these situations, the A players follow their taste. There is (trivially) anticonformity in salience based reward and the A players randomize in this case. Most complicated is the case of homophily-based reward. We can show that conformity is more likely for a higher p and anticonformity is more likely for a lower p. The A players follow their own taste. The last result could only be shown for $N \leq 1000$, though.

B Statistical Appendix

B.1 Similarity of colors

Figure B1 illustrates three distance variables we use to quantify the similarity of a target color to the three colors of the other group members (Colors 1-3). The different values of the distance variables are graphically illustrated by the total length of the red segments in each panel. Figure B1 illustrates the three distance variables for the RGB color metric. The RGB metric measures the difference between two colors by their Euclidean distance in the intensity of the three basic components red, green and blue.

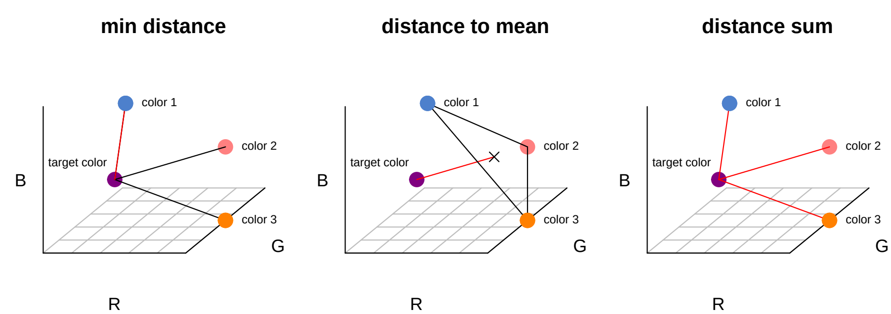

Figure B1. *Distance variables for the similarity of colors*

Red lines in the three panels illustrate the three variables used to determine color similarity in Experiment 2 for the RGB metric. The axes labels R, G, and B indicate the three components red, green, and blue of the RGB colorspace. The black and red lines between colors reflect the Euclidean distance between two colors in the three-dimensional space. *min distance* is the minimum of the three Euclidean distances, *distance to mean* the Euclidean distance to the average color, and *distance sum* the sum of the three Euclidean distances.

The variable *min distance* in the left panel reflects the minimum of the three Euclidean distances of the chosen color to each of the colors chosen by the group members in the RGB color space. The variable *distance to mean* in the central panel reflects the Euclidean distance to the average of the other three colors. The variable *distance sum* in the right panel reflects the sum of the three Euclidean distances.[3]

For the statistical analyses, we mainly focus on the *min distance* variable, which has been proposed as a measure of the spatial cohesion of individuals in groups (Clark and Evans, 1954). We use the *min distance* variable in combination with the RGB metric since the RGB metric is the most frequently used color difference metric. We check the robustness of the experimental results of Experiment 2 based on the two remaining distance variables.

B.2 Operationalization

To calculate coordinates of the response to social influence for the binary choice data of Experiment 1, we focus on all informed choices in which the participant is informed that both other group members prefer the same alternative. We assume that the unanimity of choices of the other group members exerts social influence. We assume that social influence is not exerted if the choices of the other group members diverge. To calculate the coordinates of the social response in the model space, we use formulae (B.7) and (B.8) together with a simple distance function that is positive if the informed choice differs from the alternative chosen by both other group members and that is zero otherwise.

For Experiment 2, we elicit participants' uninformed choices which are subsequently transmitted to the other members of the group. Each group member makes her informed

[3] While the RGB color metric is the most common specification to measure color distance, it does not effectively reflect perceived differences in colors. Therefore, we additionally calculate the values of the three variables illustrated in Figure B1 for the ΔE^* distance metric. The distance metric ΔE^* was proposed by the International Commission on Illumination in 1976 to eliminate perceptual non-linearity in the RGB colorspace. It has been refined twice to better fit the human perception of differences in color. We use the R package *colorscience* (Gama and Davis, 2018) to generate color differences based on the most recent definition of the ΔE^* metric (CIE 2000).

choice after being informed about the uninformed choices of the other group members. Participants know that the informed choice of one randomly selected participant would be evaluated together with the uninformed choices of the other group members. To calculate coordinates of the response to social information for the multinomial choice data of Experiment 2, we focus on all situations in which the informed choice could be adjusted in both directions, towards and away from the behavior of the other group members. We use formulae (B.3) and (B.4) to calculate the coordinates of the social response in the model space.

B.2.1 Multinomial choices

To fix ideas, assume we observe N pairs of nonsocial and informed choices with index $i = \{1, \ldots, N\}$. Let Δ be a variable that indicates the difference of a choice to the choices of others. Let Δ_i^{ns} and Δ_i^{s} indicate the values of this variable for the uninformed choice and the informed choice of the ith pair of choices. We define the probability to observe an adjustment of the informed choice *towards* the choices of others as the relative frequency of adjustments that decrease Δ:

$$P(towards) = \frac{\Sigma_{i=1}^{N} I(\Delta_i^{ns} > \Delta_i^{s})}{N} \tag{B.1}$$

We define the probability to observe an adjustment *away* from the choices of others as the relative frequency of adjustments that increase Δ:

$$P(away) = \frac{\Sigma_{i=1}^{N} I(\Delta_i^{ns} < \Delta_i^{s})}{N} \tag{B.2}$$

The coordinates (x, y) which locate the observed response to social influence in the model space are:

$$x = P(towards) + P(away) \tag{B.3}$$

$$y = P(towards) - P(away) \tag{B.4}$$

Two comments are in order. First, the operationalization neglects the size of the adjustment $|\Delta_i^{ns} - \Delta_i^s|$ which may contain information about the response to social influence. Second, formulas (B.1) and (B.2) assume that it is possible to adjust every informed choice in both directions. This is usually the case in our experimental setup.

B.2.2 Binary choices

If the choice format is binary it will only be possible to adjust in one of the two directions. In this case, we estimate $P_b(towards)$ by the relative frequency of adjustment for observations N^t in which an adjustment of the informed choice *towards* the choices of others is possible. We estimate $P_b(away)$ by the relative frequency of adjustment for observations N^a in which an adjustment of the informed choice *away from* the choices of others is possible. The corresponding equations are:

$$P_b(towards) = \frac{\Sigma_{i \in N^t} I(\Delta_i^{ns} > \Delta_i^s)}{|N^t|} \tag{B.5}$$

and

$$P_b(away) = \frac{\Sigma_{i \in N^a} I(\Delta_i^{ns} < \Delta_i^s)}{|N^a|} \tag{B.6}$$

The coordinates (x, y) which locate the binary choices in the model space are:

$$x = P_b(towards) + P_b(away) \tag{B.7}$$

$$y = P_b(towards) - P_b(away) \tag{B.8}$$

The coordinates yield an estimate for the location of the response to social influence under the assumption that adjustments in each direction are possible in half of the observations. This might not be true given the data but yields an unbiased estimate of the location of the response to social influence.

B.3 Supplementary figures and tables

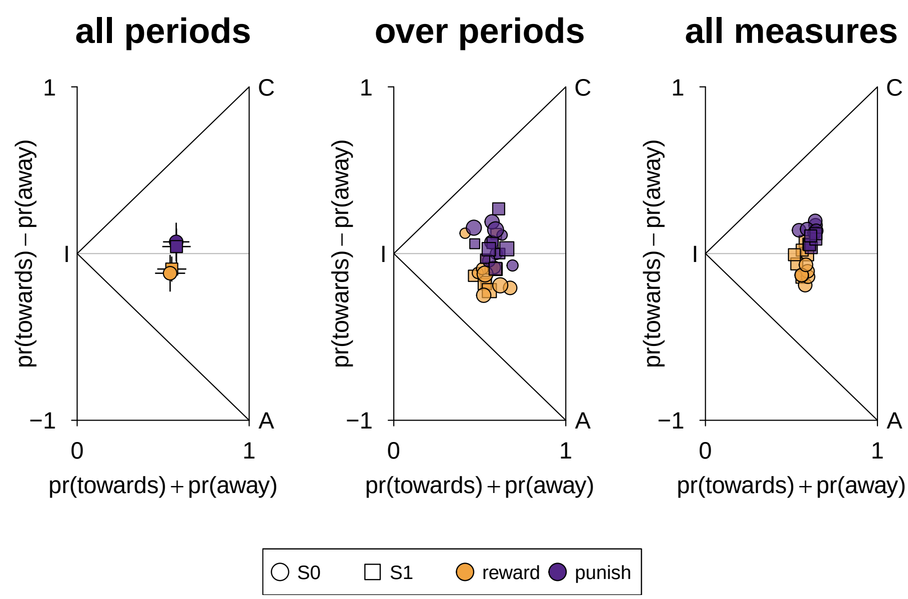

Figure B2. *Robustness of treatment effect in Experiment 2*

Left panel: average response to social influence for data of all periods. Central panel: evolution of the average response effect over periods. Bigger dots reflect later periods. Right panel: average response for each of the 6 possible combinations of the three distance variables and the two color metrics.

B.4 Analysis of heterogeneity

To analyze heterogeneity in conditional choices, we fit mixture models with K response types to the data of each treatment and select K based on the Bayesian information criterion (Schwarz, 1978). We use the R package *stratEst* (Dvorak, 2023) to obtain maximum likelihood estimates and block-bootstrapped standard errors of the parameters of the mixture models. The log likelihood of the mixture model is

$$\ln L = \sum_{i=1}^{N} \ln \left(\sum_{k=1}^{K} p_k \prod_{s=1}^{S} \prod_{r=1}^{R} (\pi_{ksr})^{y_{isr}} \right). \tag{B.9}$$

where p_k denotes the frequency of type k in the sample, s is an index for the choice situations the participants $i \in \{1, \cdots, N\}$ are confronted with in the experiment, r the number of alternatives in these situations, and y_{isr} the number of times participant i shows response r in situation s.

For the data of the first experiment $S = 2$ applies as we focus on two situations, one in which conformity is possible and the other in which anticonformity is possible. In both situations $R = 2$ applies as there are only two responses possible: adjust or not. For the data of the second experiment $S = 1$ and $R = 3$ applies as we focus exclusively on the situation where an adjustment in the direction of conformity, an adjustment in the direction of anticonformity, and no adjustment are possible.

Estimates and standard errors of type position

Let π_k^t and π_k^a be the maximum likelihood estimates of the probabilities that type k adjusts *towards* and *away* from others' choices respectively.

For Experiment 1, $\pi_k^t = \pi_{ks\prime r\prime}$ where $s\prime$ indicates the situation in which conformity is possible and $r\prime$ the response to adjust. $\pi_k^a = \pi_{ks^* r\prime}$ where s^* indicates the situation in which anticonformity is possible.

For Experiment 2, $\pi_k^t = \pi_{ksr\prime}$ where $r\prime$ indicates the response to adjust in the direction of conformity, and $\pi_k^a = \pi_{ksr^*}$ where r^{star} indicates the response to adjust n the direction of anticonformity.

The coordinates of type k in the two dimensional model space are calculated based on:

$$x_k = \pi_k^t + \pi_k^a \quad \text{and} \quad y_k = \pi_k^t - \pi_k^a.$$

The standard errors of the coordinates se_{x_k} and se_{y_k} are estimated by block-bootstrapping the variance-covariance matrix of the response probabilities π_{ksr}:

$$se_{x_k} = \sqrt{var(\pi_k^t) + var(\pi_k^a) + 2cov(\pi_k^t, \pi_k^a)}$$

$$se_{y_k} = \sqrt{var(\pi_k^t) + var(\pi_k^a) - 2cov(\pi_k^t, \pi_k^a)}$$

where $var(\cdot)$ and $cov(\cdot, \cdot)$ denote the entries corresponding to the response probabilities in the block-bootstrapped variance-covariance matrix.

Table B5. *Average distance of adjusted choices across treatments*

	reward	punishment	t-statistic	df	p-value
S0 & S1 POOLED					
RGB distance					
min distance	0.56	0.50	3.60	85	<0.001
sum distances	2.37	2.23	2.67	85	0.005
distance to mean	0.66	0.61	2.57	85	0.006
rank min distance	2.67	2.41	4.49	82	<0.001
rank sum distances	2.65	2.39	4.01	82	<0.001
rank distance to mean	2.61	2.40	3.38	82	0.001
ΔE^* distance (CIE, 2000)					
min distance	30.87	26.73	4.50	85	<0.001
sum distances	139.22	129.54	2.93	83	0.002
distance to mean	40.19	36.90	2.67	78	0.005
rank min distance	2.72	2.43	4.21	83	<0.001
rank sum distances	2.66	2.39	4.08	82	<0.001
rank distance to mean	2.60	2.41	2.73	81	0.004
S0 TREATMENTS					
RGB distance					
min distance	0.56	0.50	2.79	36	0.004
sum distances	2.38	2.23	2.07	38	0.023
distance to mean	0.67	0.61	2.32	39	0.013
rank min distance	2.73	2.42	3.91	43	<0.001
rank sum distances	2.72	2.35	4.70	45	<0.001
rank distance to mean	2.69	2.34	4.35	45	<0.001
ΔE^* distance (CIE, 2000)					
min distance	32.06	26.75	4.19	42	<0.001
sum distances	143.85	130.13	3.16	37	0.002
distance to mean	42.34	37.38	3.01	34	0.002
rank min distance	2.78	2.43	3.65	44	<0.001
rank sum distances	2.76	2.39	4.27	40	<0.001
rank distance to mean	2.71	2.43	3.07	41	0.002
S1 TREATMENTS					
RGB distance					
min distance	0.55	0.50	2.25	34	0.015
sum distance	2.37	2.22	1.67	35	0.052
distance to mean	0.65	0.61	1.29	36	0.102
rank min distance	2.61	2.41	2.39	37	0.011
rank sum distances	2.56	2.44	1.20	33	0.120
rank distance to mean	2.52	2.46	0.62	30	0.271
ΔE^* distance (CIE, 2000)					
min distance	29.50	26.71	2.13	32	0.020
sum distances	133.9	128.82	1.03	35	0.155
distance to mean	37.71	36.32	0.80	36	0.214
rank min distance	2.64	2.43	2.23	38	0.016
rank sum distances	2.53	2.40	1.47	37	0.074
rank distance to mean	2.47	2.39	0.76	38	0.225

Table B5 shows averages of matching group averages.

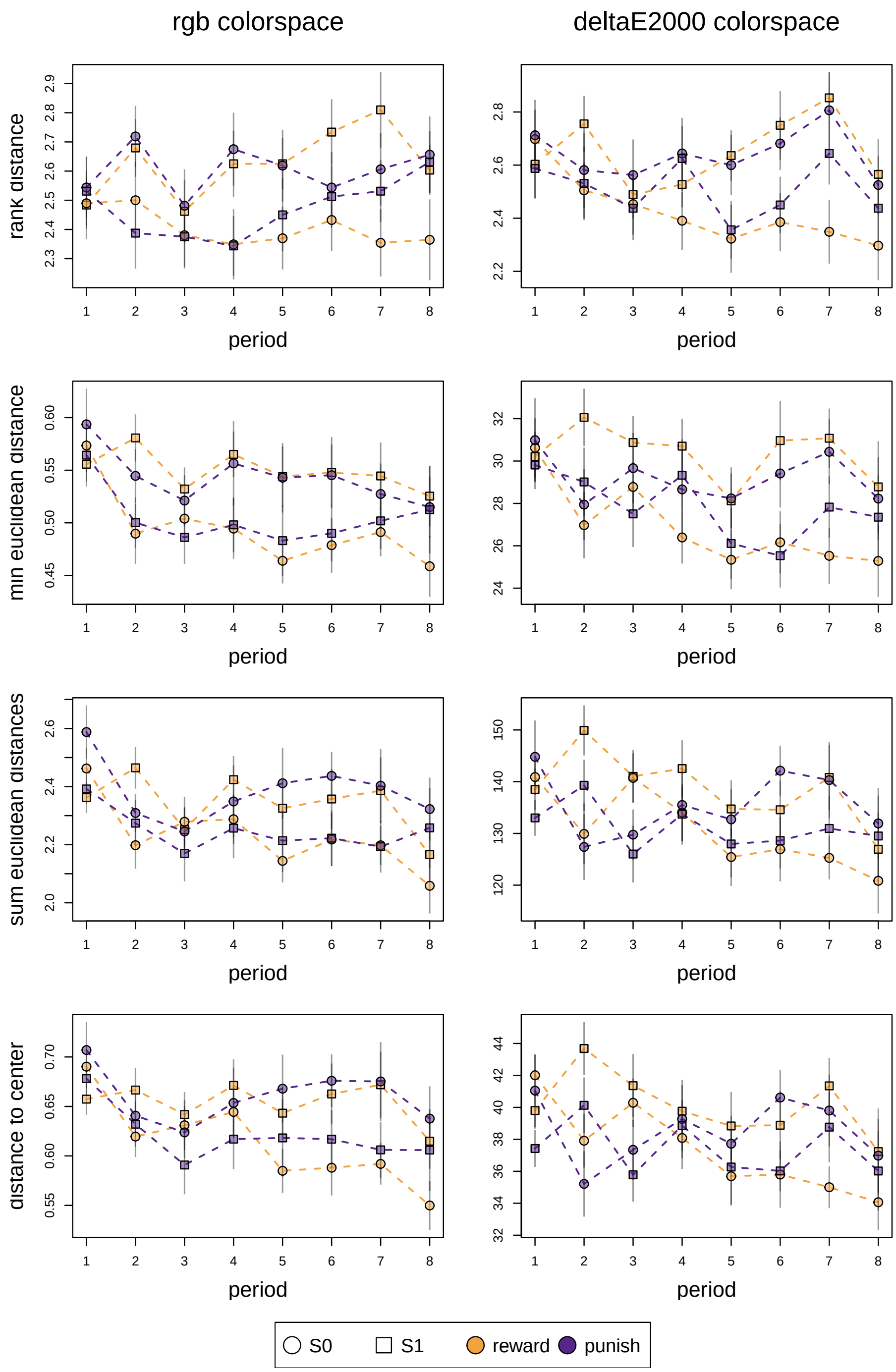

Figure B3. *Evolution of distance measures over periods*

Evolution of the average distance of informed choices over the eight periods of Experiment 2. The dots indicate period specific means of the six distance variables and the rank of the minimal distance in combination with the rgb metric. Whiskers indicate plus/minus one standard error of the mean, based on 10000 block bootstrap samples (group ID).

B.5 Details on determinants of the adjustment of informed choices

Tables B6 and B7 show the results of multinomial logit models where a dummy variable indicating an adjustment of the informed choice is regressed on characteristics of the predicted (Experiment 1) or initial (Experiment 2) choice.

In Table B6, the regressor *preference strength* is a continuous variable capturing the predicted strength of the preference for the predicted choice in Experiment 1.[4] The variables *majority choice* and *unique choice*, respectively, are dummies indicating whether the predicted uninformed choice is made by both other group members (**X**,XX) or by no other group member (**X**,YY), respectively. The baseline category refers to the situation where the choices of the other group members differ (**X**,XY).

Table B6. *Logit models for the adjustment of choices in Experiment 1*

	facts								taste							
	reward			control		punish			reward			control		punish		
	S0	S1	S2	S0	S2	S0	S1	S2	S0	S1	S2	S0	S2	S0	S1	S2
preference	-1.45	-0.75	-1.18	-1.35	-1.32	-1.68	-1.45	-1.06	-1.41	-1.18	-0.99	-2.69	-2.49	-1.20	-1.44	-1.33
strength	(0.62)	(0.57)	(0.47)	(0.39)	(0.81)	(0.64)	(0.57)	(1551.20)	(0.32)	(0.42)	(0.45)	(0.56)	(1.11)	(0.68)	(0.43)	(0.56)
majority	-1.41	-1.79	-0.13	-2.41	-3.85	-2.77	-2.52	-21.23	-0.24	-0.50	0.43	-1.22	-2.59	-2.18	-1.88	-2.65
choice	(0.36)	(0.42)	(0.28)	(0.35)	(8.03)	(0.66)	(1.32)	(2511.48)	(0.27)	(0.28)	(0.30)	(0.29)	(1.45)	(0.47)	(0.42)	(1.32)
unique	0.56	0.82	0.14	1.54	1.28	2.32	1.68	3.65	0.06	0.33	-0.70	0.87	0.93	1.17	1.71	2.56
choice	(0.31)	(0.33)	(0.28)	(0.24)	(0.40)	(0.35)	(0.35)	(12.29)	(0.25)	(0.28)	(0.36)	(0.28)	(0.39)	(0.29)	(0.33)	(0.54)
Obs	284	287	259	356	230	320	287	227	284	285	266	360	235	286	304	233
N	54	51	45	60	42	54	51	39	54	51	45	60	42	54	51	39

Shown are multinomial logit coefficients and block-bootstrapped standard errors in parentheses. The dependent variable is a dummy for intransitivity that takes the value of 1 when the informed choice is adjusted. The independent variables all refer to the predicted choice for Stage 2, based on Stage 1. *Obs* and *N* indicate the number of observations and participants. Note that the huge standard errors for the *Facts Punishment S2* treatment arise from the fact that heterogeneity is basically absent due to ample conformity in this treatment, as evident from Figure 2.

First, the stronger a group member's predicted *preference strength* in the predicted informed choice, the less likely intransitivity occurs (consistently negative coefficients across

[4]Measured by the average of the signed preference strengths of the two uninformed choices. If σ_{XY} is the strength of the preference in favor of X when the alternative is Y then we predict σ_{YZ} as the average of σ_{YX} and $\sigma_{XZ} = -\sigma_{ZX}$.

Table B7. *Logit models for the adjustment of choices in Experiment 2*

	creativity			
	reward		punish	
	S0	S1	S0	S1
intercept	0.74	0.68	0.27	0.54
	(0.24)	(0.48)	(0.31)	(0.37)
min distance	-0.96	-0.28	0.08	-0.03
	(0.34)	(0.38)	(0.32)	(0.35)
beautiful color	-0.23	-0.24	0.26	-0.29
	(0.25)	(0.44)	(0.37)	(0.44)
interesting color	0.19	-0.14	-0.01	0.09
	(0.43)	(0.35)	(0.44)	(0.41)
Obs	736	640	768	640
N	92	80	96	80

Shown are multinomial logit coefficients and block-bootstrapped standard errors in parentheses. The dependent variable is a dummy that takes the value of 1 when the informed choice is adjusted. The independent variables refer to a designer's initial uninformed choice in Stage 1. The variables reflecting how *beautiful* and *interesting* a designer perceives a color are continuous. *Obs* and *N* indicate the number of observations and participants in the sample.

all treatments). *Preference strength* has a statistically significant impact in most cases as can be derived from the precisely estimated coefficients. An outlier is the *Facts Punishment S2* treatment where the majority choice is always selected.

Second, the variables *majority choice* and *unique choice* capture how common the predicted item is in the group. Overall, intransitivity is less likely if the predicted item matches the choices of the other group members (indicated by the mostly negative coefficients of *majority choice*), and intransitivity is more likely if the predicted choice stands out (indicated by the mostly positive coefficients of *unique choice*).

These different responses to negative and positive consequences of being selected are particularly pronounced in the *S2* treatments. Deviations from the initial majority choice hardly exist in the *Facts* domain under *Punishment*. In the *Taste* domain under *Reward*, the coefficients of *majority choice* as well as *unique choice* even reverse their signs, implying that intransitivity is more likely if the predicted item is selected by others, and less likely if it has not been selected by others.

Table B7 shows the results of the same exercise for Experiment 2. The variable *min distance* reflects the minimum of the three Euclidean distances of the in Stage 1 initially chosen color to each of the colors chosen by the group members. The variables capturing how *beautiful* and *interesting* a color is refer to a designer's rating of their uninformed choice.

In the *Creativity* domain, the logit coefficients indicate that the decision to adjust the choice under social influence is affected by strategic considerations in the *Reward*, but not in the *Punishment* treatments. Participants more frequently adjust their informed choice under *Reward* the more similar their initially chosen color is to the color of a group member, as captured by the negative coefficients of the minimum Euclidean distance. This effect is substantial in *S0* and weak but qualitatively in the same direction in the *S1* treatment.

C Design

C.1 Additional design details

Training stage of Experiment 1

In the training stage, participants are shown sets of three icons, where either all three icons are exactly the same, or one icon is different from the other two. Different from the actual experiment, these training items do not reflect choices by other participants. For example, three copies of an icon showing one dot, or two copies of a one-dot-icon and one three-dots-icon (the full list of training icons is provided in Table C11 of the Appendix).

In each set, they are asked to select one icon, and their payoff increases by 0.002 euros for each percentage point of the total number of other participants in same session that match their decision. As in the coordination tasks of Stage 3, the position of the icons on the screens is randomized to rule out the possibility of location-based coordination.

Evaluators in Experiment 2

To let evaluators gain experience with the designers' setting and get a sense of the color creation process, they participated in the pre-stage of each round, where they could generate colors just for play.

C.2 Decision screens

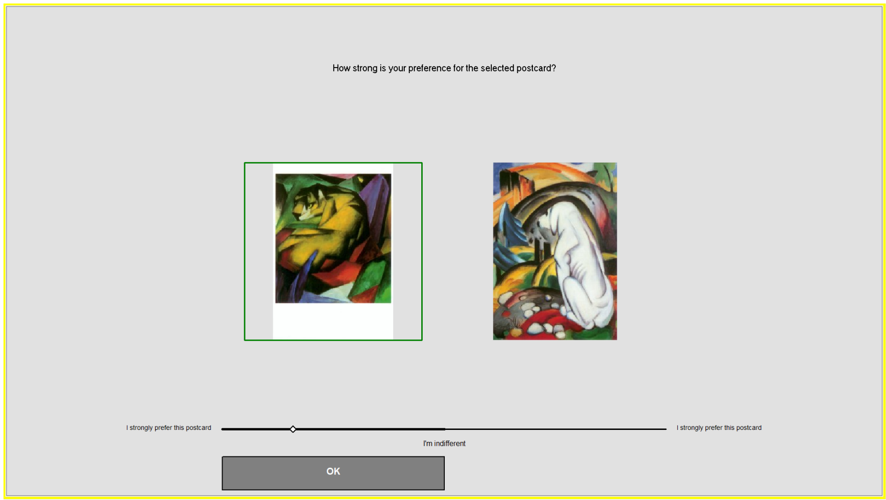

Figure C4. *Eliciting preference strength*

After participants select one option and confirm their selection, the slider in the lower part of the screen appears.

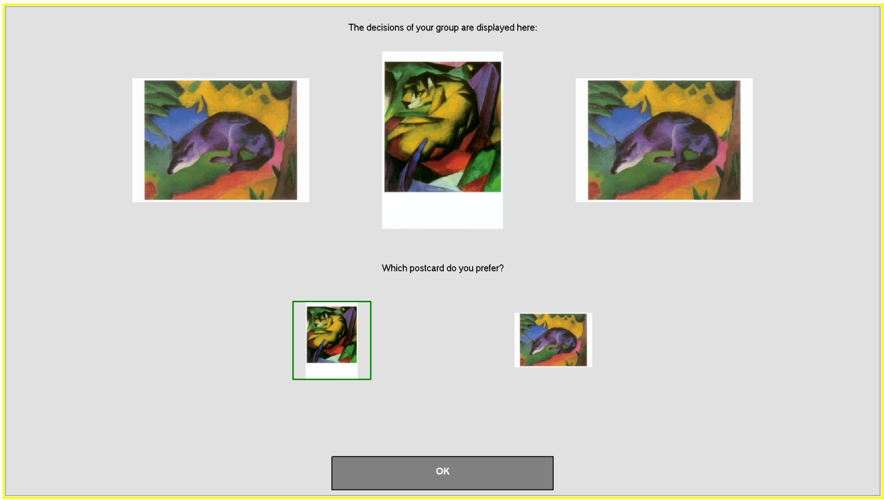

Figure C5. *Decision screen of an informed choice*

The decisions of the two other group members are depicted as the paintings on the left and right in the top line. The painting in the middle represents the choice currently selected by the participant.

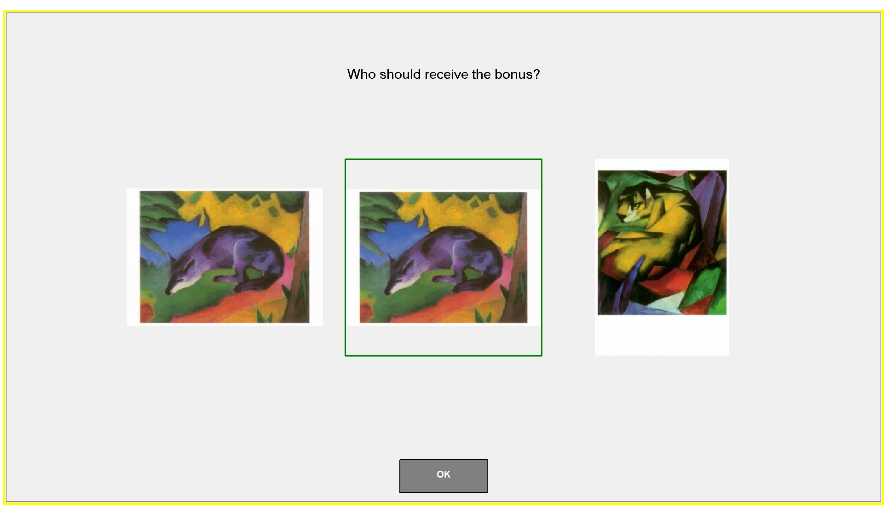

Figure C6. *Decision screen of evaluator*

Screen of an evaluation decision. The evaluator selects one of the three group members by clicking on one of the paintings. The evaluation decision has to be confirmed by clicking on the "Ok" button.

C.3 Lists of art paintings, facts questions and training items

Table C8. *List of paintings*

Set	Theme	Painting 1	Painting 2
1	Marc Chagall	Bride and Groom	The couple
2	Lyonel Feininger	The Grain Tower at Treptow on the Rega	Village Pond of Gelmeroda
3	Claude Monet	The Artist's Garden in Giverny	The artist's Garden in Giverney
4	Wassily Kandinsky	Improvisation 26	Improvisation 28 (2nd version)
5	August Macke	Garden Restaurant	Large Bright Walk
6	Franz Marc	Yellow Cow	The Dog in Front of the World
7	Caspar D. Friedrich	The Churchyard Gate	Hutten's Grave (Ruin of a Church Choir)
8	Houses	Egon Schiele, House with drying Laundry	Albrecht Duerer, The Castle of Trient
9	Work	Paul Cézanne, The Mowers	Vincent van Gogh, Field with Farmer and Mill
10	Women	August Macke, Portrait with Apples	Pablo Picasso, The Absinthe-Drinker
11	Trees	Paul Cézanne, The Chestnut Trees at Jas de Bouffan	Rudolph von Alt, Landscape in the Prater in Vienna
12	Hands	Albrecht Duerer, The Hands of Jesus Christ	Pablo Picasso, Crossed Hands
13	Ships	Egon Schiele, Fishing Boats in Trieste	Berthe Morisot, The Harbour of Nice
14	Flowers	Paul Cézanne, Flowers in a Vase and Fruit	Vincent van Gogh, Bouquet of Irises
15	Bridges	Claude Monet, Bridge over the Seine near Argenteuil	Vincent van Gogh, The Bridges of Asnières
Set	Theme	Painting 3	Painting 4
1	Marc Chagall	The Newly-Married of the Eiffel-Tower	Lovers
2	Lyonel Feininger	Gelmeroda IX	The Church of Halle
3	Claude Monet	The artist's Garden in Vétheuil	Resting under the Lilac
4	Wassily Kandinsky	Improvisation 34 (Orient II)	Improvisation Gorge
5	August Macke	Girls under Trees	Sunny Path
6	Franz Marc	The Tiger	Fox (Blue Black Fox)
7	Caspar D. Friedrich	Ruins of the Monastery Eldena	The Graveyard Door (The Churchyard)
8	Houses	Rudolph von Alt, The "Goldene Dachl" in Innsbruck	Carl Spitzweg, A Hypochondriac
9	Work	Carl Spitzweg, The Walk of the Boarding School	Pond at the Forest
10	Women	Egon Schiele, Peasants-Girl	Gustav Klimt, Johanna Staude
11	Trees	Vincent van Gogh, Road with Cypress and Star	Alfred Sisley, The Path to the Old Ferry at By
12	Hands	Egon Schiele, Clasped Hands	August Rodin, The Cathedral - Hands
13	Ships	Redon Odilon, The Mystical Boat	Raoul Dufy, The old Harbour of Marseille
14	Flowers	Claude Monet, Vase of Flowers	Pierre-Auguste Renoir, Bouquet of Chrysanthemums
15	Bridges	Alfred Sisley, Bridge near Hampton Court	William Turner, Old Welsh Bridge, Shrewsbury

Before each session, we selected 10 sets and for each set three of the paintings listed based on availability. Postcards of the paintings were ordered from Kunstverlag Reisser, Braunschweigstrasse 12, 1130 Vienna, Austria. Names are translations from German and taken from http://www.reisser-kunstpostkarten.de.

Table C9. *Question sets 1-9*

Set	Question	Option 1	Option 2	Option 3	Answer 1	Answer 2	Answer 3
1	Which country is larger (2015, m^2)?	Canada	USA	China	9984k	9826k	9596k
1	Which country is larger (2015, m^2)?	Portugal	Czech Republic	Austria	92090	78867	83871
1	Which country is larger (2015, m^2)?	Estonia	Denmark	Netherlands	45228	43094	41543
1	Which country is larger (2015, m^2)?	Lithuania	Croatia	Latvia	65300	56594	64589
1	Which country is larger (2015, m^2)?	Sudan	Indonesia	Mexico	1,861k	1,904k	1,964k
2	Which country has more inhabitants (2014)?	France	Italy	UK	65,835k	60,782k	64,351k
2	Which country has more inhabitants (2014)?	Spain	Ukraine	Poland	46,512k	45,245k	38,017k
2	Which country has more inhabitants (2014)?	Greece	Belgium	Czech Republic	10,926k	11,203k	10,512k
2	Which country has more inhabitants (2014)?	Austria	Switzerland	Bulgaria	8,506k	8,139k	7,245k
2	Which country has more inhabitants (2014)?	Malta	Luxemburg	Iceland	425k	549k	325k
3	Which company had more employees (2014)?	Bosch	Daimler	Metro	290,183	279,972	24,9150
3	Which company had more employees (2014)?	Bayer	ThyssenKrupp	Continental	118,900	160,745	189,168
3	Which company had more employees (2014)?	Lufthansa	BASF	BMW	118,781	113,292	116,324
3	Which company had more employees (2014)?	RWE	E.ON	MAN	59,784	58,503	55,903
3	Which company had more employees (2014)?	Bertelsmann	SAP	TUI	112,037	74,406	77,309
4	Who was born earlier?	Konrad Adenauer	F.D. Roosevelt	Theodor Heuss	1876	1882	1884
4	Who was born earlier?	Willy Brandt	John F. Kennedy	Walter Scheel	1913	1917	1919
4	Who was born earlier?	Helmut Schmidt	Richard Nixon	R. Weizsaecker	1918	1913	1920
4	Who was born earlier?	Horst Koehler	Gerhard Schroeder	Bill Clinton	1943	1944	1946
5	Which harbor is bigger (2014, TEU)?	Shanghai	Hong Kong	Singapore	35.3	22.30	33.9
5	Which harbor is bigger (2014, TEU)?	Hamburg	Antwerp	Los Angeles	9.7	9	8.3
5	Which harbor is bigger (2014, TEU)?	Guangzhou	Dubai	Rotterdam	16.2	15.2	12.3
6	Which airline had more passengers?	United Airlines	American Airlines	Ryanair	90,440k	87,830k	86,370k
6	Which airline had more passengers?	Lufthansa	Easyjet	Air China	59,850k	62,310k	54,580k
6	Which airline had more passengers?	Air Berlin	Brithish Airlines	Air France	29,910k	41,160k	45,410k
6	Which airline had more passengers?	KLM	Aeroflot	SAS	27,740k	23,600k	27,390k
7	Which country discharges more CO2 (2010, pp)?	Germany	Netherlands	Austria	12.3	10.1	12.1
7	Which country discharges more CO2 (2010, pp)?	Poland	Slovakia	Hungary	7.7	7.8	7.3
7	Which country discharges more CO2 (2010, pp)?	Lithuania	Latvia	Estonia	5.9	6.5	13.5
7	Which country discharges more CO2 (2010, pp)?	France	Portugal	Spain	9	6.9	8.5
7	Which country discharges more CO2 (2010, pp)?	Finland	Norway	Sweden	18.7	10.1	9.3
8	Which country has more inequality (2012, GINI)?	France	Belgium	Austria	33.1	27.6	30.5
8	Which country has more inequality (2012, GINI)?	Norway	Finland	Sweden	25.9	27.1	27.3
8	Which country has more inequality (2012, GINI)?	Bolivia	Ecuador	Peru	46.7	46.6	45.1
8	Which country has more inequality (2012, GINI)?	Costa Rica	Brazil	Argentina	48.6	52.7	42.5
8	Which country has more inequality (2012, GINI)?	Thailand	Laos	Vietnam	39.3	37.9	38.7
9	Which soccer club is worth more (2016)?	Manchester City	FC Chelsea	M. United	501.75	490	411.25
9	Which soccer club is worth more (2016)?	AS Rom	FC Valencia	SSC Neapel	250.7	282	284
9	Which soccer club is worth more (2016)?	Bayer 04 Leverkusen	VfL Wolfsburg	FC Schalke 04	211.1	183.1	199.8
9	Which soccer club is worth more (2016)?	Zenit St.Petersburg	AC Mailand	FC Sevilla	198.6	188.1	186.2

Sources: http://appsso.eurostat.ec.europa.eu, https://de.wikipedia.org, http://de.statista.com, http://carbonfootprintofnations.com, http://databank.worldbank.org, http://www.transfermarkt.de

Table C10. *Question sets 10-19*

Set	Question	Option 1	Option 2	Option 3	Answer 1	Answer 2	Answer 3
10	Which country won more medals (2014 Olympics)?	Netherlands	France	Germany	24	15	19
10	Which country won more medals (2014 Olympics)?	Switzerland	Sweden	Austria	11	15	17
10	Which country won more medals (2014 Olympics)?	Canada	Norway	USA	26	28	
10	Which country won more medals (2014 Olympics)?	Finland	UK	Ukraine	5	4	2
10	Which country won more medals (2014 Olympics)?	Belarus	Kazakhstan	Australia	6	1	3
11	Which airport has more passengers (2014)?	Atlanta Int	L Heathrow	Dubai Int	96,178k	73,408k	70,475k
11	Which airport has more passengers (2014)?	Singapore Changi	Kuala Lumpur	Shanghai Int	54,093,000	48,930k	51,687k
11	Which airport has more passengers (2014)?	Charles de Gaulles	Frankfurt	A Schiphol	63,813k	59,566k	54,978k
11	Which airport has more passengers (2014)?	Madrid Barajas	SP-Guarulhos	Miami Int	41,822k	39,765k	40,941k
12	Who sold more records in Germany?	The Beatles	Michael Jackson	Madonna	7,600k	11,275k	12,300k
12	Who sold more records in Germany?	ACDC	ABBA	R. Williams	10,475k	10,800k	9,275k
12	Who sold more records in Germany?	Helene Fischer	Pur	Die Aerzte	9,150k	9,425k	7,850k
12	Who sold more records in Germany?	Britney Spears	Bon Jovi	Xavier Naidoo	5,050k	5,150k	5,525k
13	In which language is the letter "a" more frequent?	German	English	French	6.51	8.167	7.636
13	In which language is the letter "a" more frequent?	Spanish	Italian	Swedish	12.53	11.740	9.300
13	In which language is the letter "a" more frequent?	German	English	French	17.4	12.702	14.715
13	In which language is the letter "a" more frequent?	Spanish	Italian	Swedish	13.68	11.790	9.900
13	In which language is the letter "a" more frequent?	Spanish	Italian	Swedish	6.71	6.880	8.800
14	Which initial letter is more common in German?	E	I	W	7.8	7.1	6.8
14	Which initial letter is more common in German?	H	I	O	7.232	6.286	6.264
14	Which initial letter is more common in German?	C	D	F	3.511	2.670	3.779
14	Which initial letter is more common in German?	J	K	V	0.597	0.590	0.649
15	Which country has more prisoners (2016, per 100k)?	USA	Cuba	Seychelles	698	510	799
15	Which country has more prisoners (2016, per 100k)?	Thailand	Russia	Ruanda	468	447	434
15	Which country has more prisoners (2015, absolute)?	Berlin	Saxony	Rhineland	3806	3385	3102
15	Which country has more prisoners (2015, absolute)?	Saxony-Anhalt	Thuringia	Hamburg	1670	1600	1559
15	Which country has more prisoners (2015, absolute)?	Schleswig-Holstein	Mecklenburg	Brandenburg	1162	1057	1324
16	Which food has more calories (per 100g)?	Paprika Yellow	Paprika Red	Paprika Green	28	33	20
16	Which food has more calories (per 100g)?	Rhubarb	Radicchio	Peperoni	14	13	20
16	Which food has more calories (per 100g)?	Zucchini	Spinach	Pak Choi	18	15	16
16	Which food has more calories (per 100g)?	Leek	Broccoli	Red cabbage	24	26	22
16	Which food has more calories (per 100g)?	Wild garlic	Eggplant	Artichoke	19	17	22
17	Which country is older?	Albania	Finland	Hungary	1912	1917	1918
17	Which country is older?	New Zealand	Norway	Panama	1907	1905	1903
17	Which country is older?	Ghana	Niger	Togo	1957	1958	1960
17	Which country is older?	Tanzania	Ruanda	Mali	1964	1962	1960
17	Which country is older?	Brazil	Uruguay	Costa Rica	1822	1825	1821
18	Which country has more internet users (2015)?	Austria	Germany	UK	83.1	88.4	91.6
18	Which country has more internet users (2015)?	Luxemburg	Netherlands	Denmark	94.7	95.5	96
18	Which country has more internet users (2015)?	Portugal	Italy	Greece	67.9	62	63.2
18	Which country has more internet users (2015)?	Myanmar	Laos	Nepal	12.6	14.3	18.1
18	Which country has more internet users (2015)?	Jamaica	Peru	Panama	53.6	52.6	52
19	Which country has more analphabets (relative)?	Guinea	Niger	Burkina Faso	74.7	84.5	71.3
19	Which country has more analphabets (relative)?	Mali	Chad	Ethiopia	66.4	62.7	61
19	Which country has more analphabets (relative)?	Liberia	Haiti	Sierra Leone	57.1	51.3	55.5
19	Which country has more analphabets (relative)?	Pakistan	Bhutan	Senegal	45.3	47.2	47.9
19	Which country has more analphabets (relative)?	Nigeria	Mozambique	Gambia	48.9	49.4	48

Sources: https://de.wikipedia.org, http://de.statista.com, http://www.lebensmittel-tabelle.de, http://www.welt-in-zahlen.de, http://www.internetworldstats.com

Table C11. *List of pre-round training icons*

Set	Theme	Icon 1	Icon 2
1	Dots	1 black dot	3 black dots
2	Lines	2 horizontal lines	4 horizontal lines
3	Arrows vertical	up	down
4	Shapes 1	circle	square
5	Operators	plus	minus
6	Balls	soccer ball	basket ball
7	Pets	cat	dog
8	Gathering	sitting	standing
9	Travel	lake	mountains
10	Evening activity	board game	listening to music
11	Food	pizza	pasta
12	Exercising	dancing	running
13	Winter sports	skiing	snowboarding
14	Summer sports	swimming	cycling
15	Seasons	summer	winter
16	Story	book	movie
17	News	newspaper	smartphone

C.4 Instructions of Experiment 1

Below we present the translated instructions (originally in German) for the *S1 Reward* treatment of Experiment 1. The other treatments deviate from the instructions presented in the following ways:

- In each session, we conducted both the *Facts* and *Taste* domains, and we varied the order. The instructions for the domain that was conducted first were presented in detail, and participants received shortened instructions for the domain conducted second. In what follows, we show the extensive instructions for the *Taste* domain and the short form instructions for the *Facts* domain.
- There was no Stage 3 in the *Control* treatments.
- In the *Punishment* treatments, we talk about a deduction (instead of a bonus) of 10 points.
- The text in blue applies to the *S1* and *S2* treatments and is omitted in the *S0* treatments. The instructions of the *S1* and *S2* treatments were identical, but an additional page of instructions was shown before the experiment in *S2* as provided in Subsection C.4.

Instructions

Please keep quiet in your cubicle and do not communicate with others during the experiment. Anyone who intentionally violates this rule will be asked to leave the experiment without payment.

If you have any questions, please raise your hand and wait for an experimenter to come to you.

The incomes will be calculated in points. At the end of the experiment, the total amount of points you have earned will be converted into euros according to the following rate:

1 point = 1 euro

You will receive your total income in cash at the end of the experiment.

Please read the instructions carefully. Once everyone has finished reading the instructions, you will answer some comprehension questions. Then you will make your decisions in the experiment. Your decisions will be treated anonymously.

General procedure

This experiment consists of two parts, each comprising three stages. In each stage, you will make several decisions. Your total income is the sum of your income from both parts.

At the beginning of the first part, you will be randomly divided into groups of three. At the beginning of the second part, you will again be divided into groups of three.

Below you will find the instructions for Part 1. You will receive the instructions for Part 2 when Part 1 is completed.

Your decisions in the first part do not affect your income in the second part.

Which postcard do you choose?

Overview

In this part, you choose between two art postcards. The paintings of the two cards are displayed on the screen and you choose which of the two motifs you prefer.

After all group members have made their decisions, the motifs selected by the three persons are shown to an evaluator. Based on the selected motifs, the evaluator marks one person of your group, who may then receive a bonus. At the end, an evaluator whose decision is relevant for the bonus in your group is randomly selected. The more other evaluators select the same person, the higher the payout of an evaluator.

These decisions are made for several pairs of postcards.

At the end of the experiment, one decision situation will be randomly selected for your group. You will receive your preferred motif from this situation as a real postcard. For each group, a different pair of postcards will be randomly drawn, from which the group members will receive their preferred card. Thus, only members of your group can potentially receive the same postcard as you at the end of the experiment.

You will receive 10 points for participating in this part. If you are the person marked in the selected decision situation, 10 more points will be added to your account. In addition you decide as an evaluator for other groups. The more similarities you have in your decisions with other evaluators, the higher your payout as an evaluator will be.

In this part, you will go through three stages, which are described in more detail below.

Stage 1

You will see two postcard motifs on the screen, as shown in Figure 1. You decide which postcard you prefer to have by clicking on the corresponding motif.

After each decision, we will ask you to indicate how strong your preference is for the motif you have selected. To do so, once you have made your decision, a bar will appear below the motifs as shown in Figure 1.

You will make these decisions sequentially for 20 pairs of postcards. The members of a group are sometimes given different pairs to choose from.

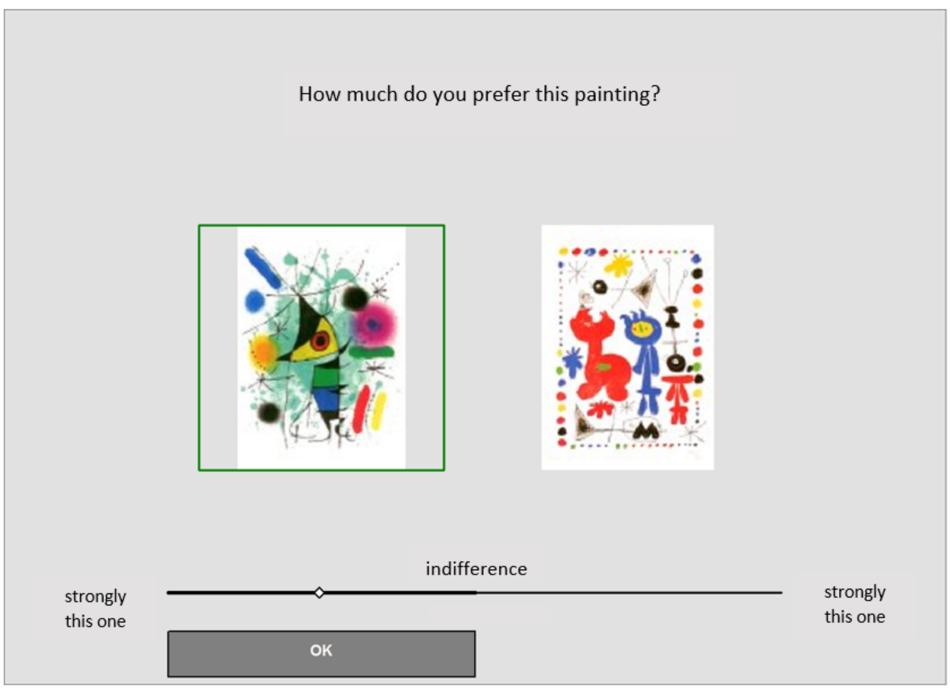

Figure 1

Stage 2

In this stage, you also choose one of two postcard motifs. The other two members of your group have already gone through the decision-making situations in their Stage 1 that you face in Stage 2. Before each decision, you will see how your group members have decided on the respective pair of postcards (upper part in Figure 2a). Again, you select a motif and indicate how strongly you prefer that motif (lower part in Figure 2b).

You make this decision in a sequence for 10 pairs of postcards.

Along with your decision, in the top row, you will see the 3 postcards that were selected by your group for the respective pair of postcards (upper part in Figure 2b). These 3 postcards are then sent to the evaluators in Stage 3, where the order of the 3 postcards on the evaluators' screens is random and can be different for each evaluator.

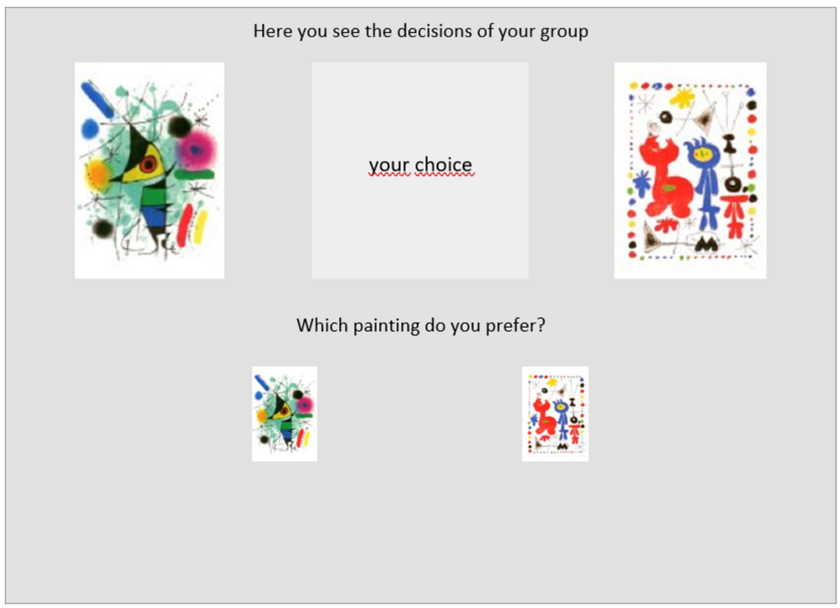

Figure 2a

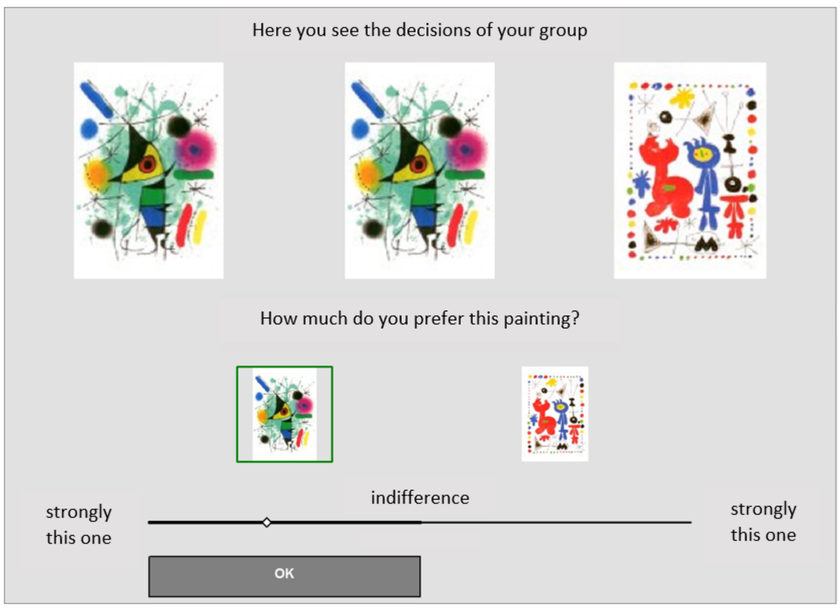
Here you see the decisions of your group
How much do you prefer this painting?
strongly
this one
indifference
strongly
this one
OK

Figure 2b

Stage 3

For a given decision situation, the 3 selected motifs of your group will be sent to members of other groups for evaluation. Based on the selected motifs, each evaluator is asked to mark a person in your group, who may then receive a bonus of 10 points. An evaluators' payoff is higher the more of the other evaluators mark the same person as she/he does.

You will also decide as an evaluator. For a given decision situation, you will see how the three members of another group have decided, and on the basis of the selected motifs, you will mark who should receive the bonus. The more of the other evaluators make the same decision as you do, the higher your payoff as an evaluator.

At the time of your decision as the evaluator, however, you do not yet know which decision situation in a group will be randomly selected for payment and how the three group members actually decided in this situation. You therefore indicate who should receive the bonus for several possible constellations (see Figure 3).

The positions where you see the preferred postcards of the three group members are determined randomly. Thus, the selected motifs of a person sometimes appear on the left, sometimes in the middle and sometimes on the right, and the positions are shuffled for each decision and each evaluator.

At the end, a random draw is made to determine which decision situation and which evaluator will be relevant for your group. One member of each group will receive the bonus.

Example: Below you see various situations that may arise in a group when choosing between two postcards. In Figure 3a, all group members have chosen the same postcard. In Figure 3b, two people chose one postcard and one person has chosen another. As the evaluator, you will mark who should receive the bonus. To do so, click on the corresponding motif. Your selection will be highlighted by a green frame.

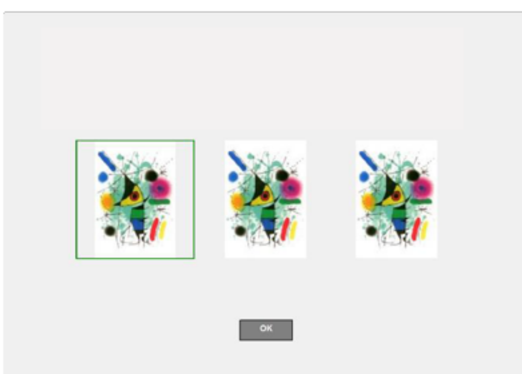

Figure 3a

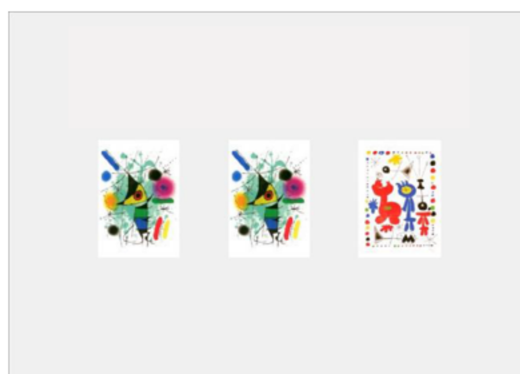

Figure 3b

Ultimately, the constellation that actually occurred in the group randomly assigned to you always applies. For example, if the group members have decided as shown in Figure 3a and have all selected the same motif, the person you marked for this constellation may receive the bonus.

Like all decisions, the evaluators' decisions are also mutually anonymous. Neither the selected person nor the evaluator will ever know the identity of the other person.

Other evaluators also decide who should receive the bonus for the same situations as you. All evaluators receive additional payments for their decisions. These payments are higher the more matches you have with other evaluators.

Concretely, you (and all other evaluators) receive 0.02 points per 10% matches for each situation. So if in a situation 10% of the other evaluators have marked the same participant as you, you will receive 0.02 points; if you match half (50%) of the others, you will receive 0.1 points; and if you match all of the other evaluators (100%), you will receive 0.2 points. According to this principle, your payoff is calculated and added up for each evaluation situation.

Please note that the displayed order of participants is random and may be different for each evaluator.

End

Finally, one decision situation per group will be selected at random. The motifs of one group are not used for another group. Therefore, it is only possible for the members of your group to receive the same postcard to take home.

You will then learn which postcard you will receive based on your decision in the randomly drawn decision situation. You will also be informed whether you were the person marked in this decision situation and thus receive a bonus.

For each of your decisions as an evaluator, you will learn to what extent your choice matches with other evaluators and what payment you will receive for this.

You will receive your postcard at the end of the experiment together with the payment.

If you have any questions, please raise your hand at any time.

Once you have read and understood the instructions, click on the “Experiment” button at the top right and then on the “Ready” button.

You can also access the instructions during the experiment. Please make sure that you do not miss out when the experiment continues.

Which answer do you choose?

For this part, you will be divided into a new group of three. The members of your new group were in three different groups in the first part.

All the procedures in this part are the same as in the previous part - with one difference: you do not decide between art postcards, but between two answers to a facts question. The question and the two answers are displayed on the screen and you choose one of the answers.

After all group members have made their decisions, the answers selected by the three individuals are shown to evaluators from other groups. Based on the answers selected, each evaluator marks one person in your group who may then receive a bonus. The order of the 3 answers on an evaluator's screen is again random and reshuffled for each decision situation and for each evaluator. As an evaluator, you also decide for other groups. All evaluators again receive an additional payment, which is higher the more often your selection matches with other evaluators.

These decisions are made for several facts questions.

At the end of the experiment, one decision situation will be randomly selected for your group. You will then be informed whether your answer in this situation was correct. A different facts question will be drawn at random for each group.

You will receive 10 points for participating in this part. If you are the person marked by the randomly selected evaluator in the randomly selected decision situation, additional 10 points will be added to your account. For your decisions as an evaluator, you will again receive 0.02 points per 10% matches with other evaluators.

This part also consists of the three stages that you have already completed in the previous part.

Once you have read and understood the instructions, click on the "Experiment" button at the top right and then on the "Ready" button.

Instructions of salience training rounds (S2 treatments)

Pre-rounds

In these pre-rounds of the experiment, you will be shown three images each on the screen, with the same motif appearing multiple times. You will mark one of these images. The more of the other participants have marked the same image as you, the higher your payoff from the pre-rounds.

You will make these decisions for multiple motifs. All decisions remain anonymous.

Example: Below you see two different situations that can occur. In Figure 1a, you see the same image three times. In Figure 1b, you see the same image twice and a different image once. In each setting, you will mark one of the three pictures by clicking on it. The other participants also mark one of the three pictures in the same settings.

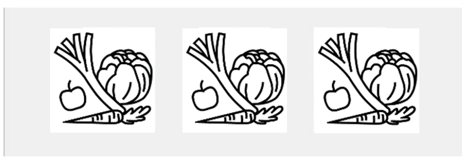

Figure 1a

Figure 1b

Note that the displayed order of the images is random and may be different for each participant. For each decision and each participant, the positions are reshuffled. Thus, the same image appears sometimes on the left, sometimes in the middle, and sometimes on the right. The image that appears in the center for you may appear on the left or on the right for other participants. This applies to situations like in Fig. 1a as well as to situations like in Fig. 1b.

Once everyone has made their decisions in a given round, you will learn how the other participants have decided. All participants receive the payoffs corresponding to their decisions. These payoffs (1 point = 1 euro) are higher the more matches you have with other participants.

Concretely, for each situation, you (and everyone else) will receive 0.02 points per 10% matches. So, if in a given situation 10% of the other participants have marked the same picture as you, you will get 0.02 points; if you match half (50%) of the others, you will get 0.1 points; and if you match all the other participants (100%), you will get 0.2 points. According to this principle, for each round your payout is calculated and added up.

If you have any questions, please raise your hand.

Once you have read and understood the instructions, click on the "Experiment" button at the top right and then on the "Ready" button.

You can also access the instructions during the experiment. Please make sure you don't miss out when the experiment continues.

C.5 Instructions of Experiment 2

Below we present the translated instructions (originally in German) for the *S1 Reward* treatment of Experiment 2. The other treatments deviate from the instructions presented in the following ways:

- In the *Punishment* treatments, we talk about a deduction (instead of a bonus) of 2 points, and the flat payment was 12 points.
- The text in blue applies to the *S1* treatment and is omitted in the *S0* treatments. There was one evaluator per group in the *S0* treatments.

Each session consisted of three parts: the main treatments (Part 1, as shown below); the Krupka-Weber tasks and color ratings (Part 2); and post-experimental questionnaires (Part 3).

Instructions

Please read the instructions carefully. If you have any questions, please raise your hand and wait for an experimenter to come to you.

Please keep quiet in your cubicle and do not communicate with others during the experiment. Your cell phones should now be switched off. If you are carrying a device that is switched on, please switch it off immediately and place it in the holder provided. Anyone who intentionally violates this rule will be asked to leave the experiment without payment.

Your incomes will be calculated in points. At the end of the experiment, the total amount of points you have earned will be converted into euros according to the following rate:

1 point = 1 euro

You will receive your total income in cash at the end of the experiment.

All your decisions as well as your payoff will be treated anonymously.

The experiment consists of three parts. On the following pages you will find the instructions for the first part. You will receive the instructions for the second and third parts once the first part has been completed. Your decisions in the first part do not affect on your income in the following parts.

Part 1

Division into groups

Before the experiment starts, you will be divided into groups of 6 people. In Part 1, you will only interact with participants from your own group. There are two roles, *designers* and *evaluators*. Each group consists of 4 designers and 2 evaluators. You will be informed of your role before Part 1 begins. The assigned roles remain the same throughout the experiment.

In the beginning, each designer receives an endowment of 12 points, and each evaluator also receives an endowment of 12 points.

General procedure

Part 1 consists of 8 rounds. Each round follows the same procedure and consists of four phases: Design phase, publication phase, evaluation phase and feedback phase. In the *design phase*, each designer generates several colors. In the *publication* phase, each designer publishes one color which will be shown to the evaluators. In the *evaluation phase*, each evaluator then selects a designer on the basis of the four published colors. If both evaluators choose the color of the same designer, they receive an additional payment. Moreover, one evaluator will be randomly drawn whose decision determines which of the designers receives a bonus of 2 points. In the *feedback* phase, the designers learn who receives the bonus.

I Design phase

In the design phase, each designer generates colors by mixing them. In each round, all designers have 2 minutes to do so. During this time, the evaluators may also generate colors to pass the time. Figure 1 explains the screen on which the colors are generated. The screen consists of 3 areas: workspace, selection area and history.

Workspace: New colors are generated in the lower left workspace. To do so, hold down the left mouse button and drag a color from the color palette or the clipboard into one of the fields of the color bar. The two colors stored in the color bar are mixed together and the result appears directly below as a mixed color. To further process mixed colors further, they can first be dragged to the clipboard by holding down the left mouse button and then used again for mixing.

Selection area: In the selection area at the bottom right, the designers can store colors that they are considering for publication. Using the arrow keys, the current mixed color can be loaded into one of the three memories (△), or a color can be loaded from a memory for editing as a mixed color (▽). The double arrow can be used to exchange the mixed color with the color in a memory.

History: In the history, starting with round 2, the designers will see all colors published by the designers in their group in the previous round. Their own color is marked by a symbol, and the color that had been selected for the bonus is outlined in grey.

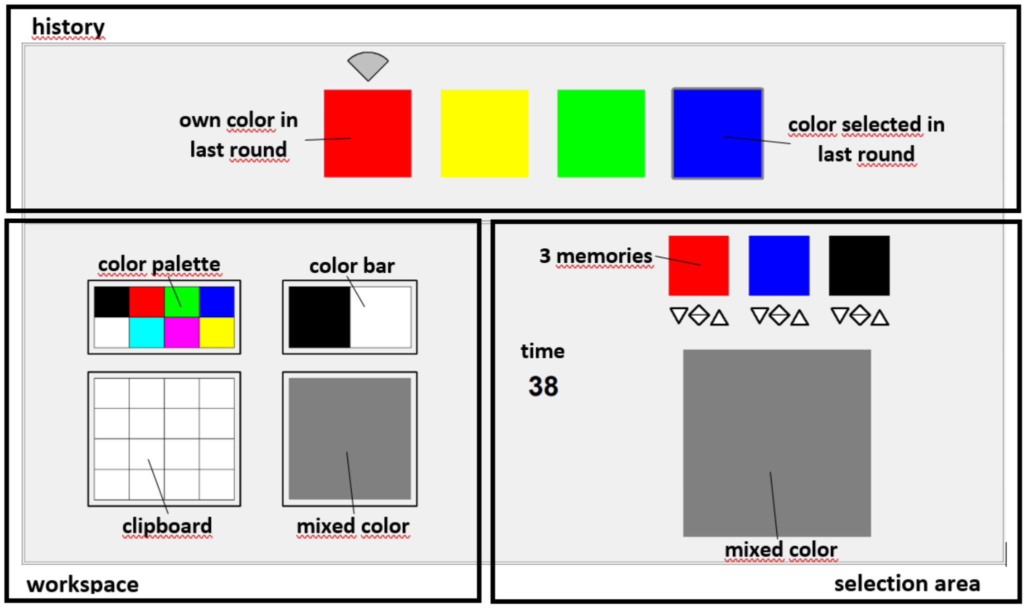

Figure 1: Screen for color generation

II Publication phase

One color from each designer will be published in each round. Only colors that are in the designer's selection area at the end of the design phase can be published. These are the colors in the three memories of the selection area as well as the current mixed color. From these four colors, each designer first makes a *preselection* and then a *conditional selection*.

Preselection: When the time of the design phase has expired, each designer first makes a preselection. To do so, they select one of the four colors in their selection area. The colors preselected by the designers are then temporarily displayed in the history for all other designers of their own group. The evaluators will not see the preselected colors.

Conditional selection: In the conditional selection that follows, each designer can adjust their decision based on the displayed results of the preselection. To do this, they again select one of their four colors.

Submission: The preselected colors of three designers are now submitted to the evaluators. However, in each round, one designer will be randomly chosen whose conditional selection referring to the three others' submitted pre-selected colors will be submitted.

All colors not selected by the designers remain private. This means that no other participant will see them at any time during the experiment.

III Evaluation Phase

The four colors submitted by the designers in a group are now displayed to the evaluators (Figure 2a). The arrangement of the colors is determined randomly in each round and for each evaluator. The position of a designer's colors therefore changes both across the rounds and across the evaluators. Therefore, a position is uninformative of a designer's previous publications. Moreover, it is likely that for the two evaluators, the same position will show different colors.

Each evaluator now selects by mouse-click one of the colors. The evaluators do not know whether a color is from the preselection or the conditional selection. The two evaluators receive an additional payment of 2 points if both have selected color of the same designer. In the example in Figure 2b, the relevant evaluator has chosen the yellow color (indicated by the grey border). Only if the irrelevant evaluator has also chosen yellow, both evaluators will receive an additional 2 points. If the evaluators have chosen different colors, they do not receive an additional payment. This does not affect the designer's payoff.

Before the first round begins, a random draw determines one of the two evaluators whose decision will be relevant for the designers. This relevant evaluator is the same person in all rounds. The other evaluator is irrelevant for the designers. However, the evaluators themselves do not know which of the two is the relevant evaluator. The designer of the color selected by the relevant evaluator receives a bonus of 2 points. This does not affect the evaluators' payoffs.

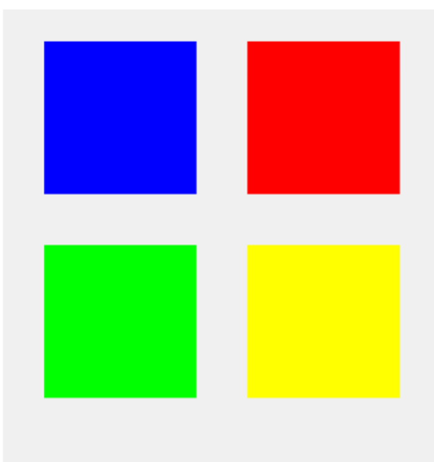

Figure 2a: evaluator selection screen

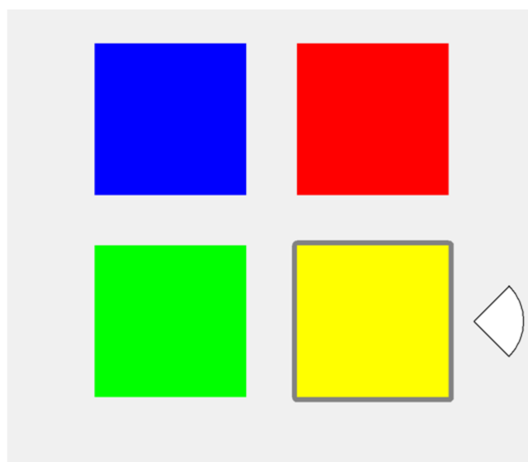

Figure 2b: designer feedback screen

IV Feedback phase

Once the evaluators have made their decisions, the designers will see the decision of the relevant evaluator (Figure 2b, grey border). The designers do not learn about the decision of the irrelevant evaluator. A designer's own color is marked by a white symbol. This way, designers can see whether they have received the bonus in case several identical colors were submitted.

At the end of a round, the evaluators do not yet know the other evaluator's choice. Only at the end of the experiment do they find out how often both have chosen the same designer and what payment they receive for that.

If you have any questions, please raise your hand. Once you have no more questions and are ready for Part 1, please click on "Experiment" in the upper right corner and then on "Inform".

References

Anderson, L.R. and Holt, C.A. (1997). 'Information cascades in the laboratory', *American Economic Review*, vol. 87(5), pp. 847–862, ISSN 00028282.

Banerjee, A.V. (1992). 'A simple model of herd behavior', *The Quarterly Journal of Economics*, vol. 107(3), pp. 797–817.

Bikhchandani, S., Hirshleifer, D. and Welch, I. (1992). 'A theory of fads, fashion, custom, and cultural change as informational cascades', *Journal of Political Economy*, vol. 100(5), pp. 992–1026.

Clark, P.J. and Evans, F.C. (1954). 'Distance to nearest neighbor as a measure of spatial relationships in populations', *Ecology*, vol. 35(4), pp. 445–453.

Dvorak, F. (2023). 'stratest: a software package for strategy frequency estimation', *Journal of the Economic Science Association*, vol. 9(2), pp. 337–349.

Gama, J. and Davis, G. (2018). *colorscience: Color Science Methods and Data*, r package version 1.0.5.

Guarino, A., Harmgart, H. and Huck, S. (2011). 'Aggregate information cascades', *Games and Economic Behavior*, vol. 73(1), pp. 167–185.

Schwarz, G. (1978). 'Estimating the dimension of a model', *Ann. Statist.*, vol. 6(2), pp. 461–464.