Beyond the Stars: The Welfare Effects of Ratings under Homogeneous and Heterogeneous Consumer Tastes
Supplemental Appendix

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1 Proofs

Proof of Proposition 1: We start by deriving the average payoff for a homogeneous-taste market without ratings (baseline). In this situation, subjects have to choose between a safe outside option or purchasing one of two quizzes but do not have access to ratings. Accordingly, the expected payoff of a subject with skill θ who chooses quiz k is

$$E[I(\mu, \tau^2, \theta)] = a + b\theta \int (1 - e^{-q}) g(q) dq,$$

where $g(q)$ denotes the density of prior beliefs. Substituting $g(q)$ by the density of $N(\mu, \tau^2)$ and integrating we obtain

$$E[I(\mu, \tau^2, \theta)] = a + b\theta(1 - e^{-\mu + \frac{\tau^2}{2}}).$$

A subject with skill θ prefers to buy quiz k instead of taking the outside option when

$$E[I(\mu, \tau^2, \theta)] > z,$$

or

$$a + b\theta(1 - e^{-\mu + \frac{\tau^2}{2}}) > z,$$

or

$$\theta > \frac{z - a}{b} \frac{1}{1 - e^{-\mu + \frac{\tau^2}{2}}} = \bar{\theta}.$$

The threshold $\bar{\theta}$ is economically meaningful only if $\bar{\theta} \in [0, 1]$, which imposes two restrictions on the primitives. The lower-bound condition $\bar{\theta} > 0$ is equivalent to $-\mu + \tau^2/2 < 0$ (i.e., $\mu > \tau^2/2$), ensuring that, in the absence of ratings, some subjects choose the outside option; the upper-bound condition $\bar{\theta} < 1$ requires $z < a + b(1 - e^{-\mu + \tau^2/2})$, ensuring that, in the absence of ratings, some subjects purchase a quiz. Under these restrictions, $\bar{\theta}$ is interior.

The average payoff of subjects who select to take a quiz has to take into account that one quiz is easy and the other quiz is hard. Since we assume subjects assign the same prior mean quality to both quizzes it follows that, in the absence of ratings, subjects are indifferent between the two quizzes and hence half choose the easy quiz and half choose the hard quiz. In this case the average payoff of subjects who take a quiz is:

$$\begin{aligned}
E[I_{HOM}(\text{Baseline})|\theta > \bar{\theta}] &= \frac{1}{\Pr(\theta > \bar{\theta})}\left[\frac{1}{2}\int_{\bar{\theta}}^{1} E[I(q_E,\theta)]f(\theta)d\theta + \frac{1}{2}\int_{\bar{\theta}}^{1} E[I(q_H,\theta)]f(\theta)d\theta\right] \\
&= \frac{1}{1-F(\bar{\theta})}\left[\frac{1}{2}\int_{\bar{\theta}}^{1}(a+b\theta(1-e^{-q_E}))f(\theta)d\theta + \frac{1}{2}\int_{\bar{\theta}}^{1}(a+b\theta(1-e^{-q_H}))f(\theta)d\theta\right] \\
&= a + b\frac{2-e^{-q_E}-e^{-q_H}}{2\left[1-F(\bar{\theta})\right]}\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta.
\end{aligned}$$

The overall average payoff for a homogeneous-taste market without ratings (baseline) takes into account those who choose the outside option and those who take a quiz:

$$\begin{aligned}
E[I_{HOM}(\text{Baseline})] &= \Pr(\theta < \bar{\theta})z + \Pr(\theta > \bar{\theta})E[I_{HOM}(\text{Baseline})|\theta > \bar{\theta}] \\
&= F(\bar{\theta})z + \left[1-F(\bar{\theta})\right]a + b\frac{2-e^{-q_E}-e^{-q_H}}{2}\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta \\
&= a + (z-a)F(\bar{\theta}) + b\frac{2-e^{-q_E}-e^{-q_H}}{2}\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta.
\end{aligned} \tag{1}$$

Next, we derive the average payoff for a homogeneous-taste market with ratings. We focus on a situation where, after many ratings have accumulated, the easy quiz is revealed. The weak law of large numbers implies

$$\bar{r}_E \xrightarrow{p} q_E \text{ and } \bar{r}_H \xrightarrow{p} q_H.$$

This together with equation (1) implies

$$E(Q|\bar{r}_E) \xrightarrow{p} q_E \text{ and } E(Q|\bar{r}_H) \xrightarrow{p} q_H.$$

Since $q_E > q_H$ subjects choose either the easy quiz or the outside option. What will be the percentages of subjects making each choice? A subject with skill θ taking the easy quiz prefers it to the outside option when

$$E[I(q_E,\theta)] = a + b\theta(1-e^{-q_E}) > z,$$

or

$$\theta > \frac{z-a}{b}\frac{1}{1-e^{-q_E}} = \bar{\theta}_E.$$

Accordingly, the average payoff of subjects who select to take the easy quiz is

$$E[I_{HOM}(\text{Ratings})|\theta > \bar{\theta}_E] = a + b\frac{1-e^{-q_E}}{1-F(\bar{\theta}_E)}\int_{\bar{\theta}_E}^{1} \theta f(\theta)d\theta.$$

The overall average payoff for a homogeneous-taste market with ratings takes into account those who choose the outside option and those who take the easy quiz:

$$\begin{aligned} E[I_{HOM}(\text{Ratings})] &= \Pr(\theta < \bar{\theta}_E)z + \Pr(\theta > \bar{\theta}_E)E[I_{HOM}(\text{Ratings})|\theta > \bar{\theta}_E] \\ &= F(\bar{\theta}_E)z + \left[1 - F(\bar{\theta}_E)\right] a + b(1-e^{-q_E})\int_{\bar{\theta}_E}^{1} \theta f(\theta)d\theta \\ &= a + (z-a)F(\bar{\theta}_E) + b(1-e^{-q_E})\int_{\bar{\theta}_E}^{1} \theta f(\theta). \end{aligned} \tag{2}$$

Using equations (1) and (2), we have that

$$E[I_{HOM}(\text{Ratings})] > E[I_{HOM}(\text{Baseline})]$$

is equivalent to

$$a+(z-a)F(\bar{\theta}_E)+b(1-e^{-q_E})\int_{\bar{\theta}_E}^{1} \theta f(\theta)d\theta > a+(z-a)F(\bar{\theta})+b\frac{2-e^{-q_E}-e^{-qH}}{2}\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta,$$

or

$$(z-a)F(\bar{\theta}_E) + b\,(1-e^{-q_E})\int_{\bar{\theta}_E}^{1} \theta f(\theta)d\theta > (z-a)F(\bar{\theta}) + b\,\frac{2-e^{-q_E}-e^{-q_H}}{2}\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta. \tag{3}$$

We consider two separate cases. In the first case, (a), we consider $q_E > \mu - \tau^2/2$, i.e., prior beliefs about quiz quality are low. In the second case, (b), we consider $q_E \leq \mu - \tau^2/2$, i.e., prior beliefs about quiz quality are high.

(a) When $q_E > \mu - \tau^2/2$, $\bar{\theta} = \frac{z-a}{b}\frac{1}{1-e^{-\mu+\tau^2/2}}$, and $\bar{\theta}_E = \frac{z-a}{b}\frac{1}{1-e^{-q_E}}$ imply $\bar{\theta} > \bar{\theta}_E$. Hence, we can write (3) as

$$\begin{aligned} &(z-a)F(\bar{\theta}_E) + b(1-e^{-q_E})\left[\int_{\bar{\theta}_E}^{\bar{\theta}} \theta f(\theta)d\theta + \int_{\bar{\theta}}^{1} \theta f(\theta)d\theta\right] \\ &\qquad > (z-a)F(\bar{\theta}) + b\frac{1-e^{-q_E}}{2}\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta + b\frac{1-e^{-q_H}}{2}\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta, \end{aligned}$$

or

$$(z-a)F(\bar{\theta}_E) + b(1-e^{-q_E})\int_{\bar{\theta}_E}^{\bar{\theta}} \theta f(\theta)d\theta + b\frac{1-e^{-q_E}}{2}\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta$$
$$> (z-a)F(\bar{\theta}) + b\frac{1-e^{-q_H}}{2}\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta,$$

or

$$b(1-e^{-q_E})\int_{\bar{\theta}_E}^{\bar{\theta}} \theta f(\theta)d\theta + b\frac{e^{-q_H}-e^{-q_E}}{2}\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta > (z-a)\left[F(\bar{\theta}) - F(\bar{\theta}_E)\right],$$

or

$$\int_{\bar{\theta}_E}^{\bar{\theta}} \left[a + b\theta(1-e^{-q_E}) - z\right] f(\theta)d\theta + b\frac{e^{-q_H}-e^{-q_E}}{2}\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta > 0, \tag{4}$$

which holds since the first term is positive given that the integrand is positive (within the integration range) and the second term is also positive since $q_E > q_H$. Note that the first term in equation (4) represents the welfare gain associated with ratings increasing buying rates: intermediate-skill subjects with $\theta \in \left[\bar{\theta}_E, \bar{\theta}\right]$ who would have chosen the outside option in the absence of ratings, buy the easy quiz. The second term in equation (4) represents the welfare gain associate with ratings increasing matching rates: high-skill subjects with $\theta \in \left[\bar{\theta}, 1\right]$ who would have bought the hard quiz in the absence of ratings, buy the easy quiz.

(b) When $q_E \le \mu - \tau^2/2$, $\bar{\theta} = \frac{z-a}{b}\frac{1}{1-e^{-\mu+\tau^2/2}}$, and $\bar{\theta}_E = \frac{z-a}{b}\frac{1}{1-e^{-q_E}}$ imply $\bar{\theta} \le \bar{\theta}_E$. Hence, we can write (3) as

$$(z-a)F(\bar{\theta}_E) + b(1-e^{-q_E})\int_{\bar{\theta}_E}^{1} \theta f(\theta)d\theta$$
$$> (z-a)F(\bar{\theta}) + b\frac{2-e^{-q_E}-e^{-q_H}}{2}\left[\int_{\bar{\theta}}^{\bar{\theta}_E}\theta f(\theta)d\theta + \int_{\bar{\theta}_E}^{1}\theta f(\theta)d\theta\right],$$

or

$$(z-a)[F(\bar{\theta}_E) - F(\bar{\theta})] + b\frac{e^{-q_H}-e^{-q_E}}{2}\int_{\bar{\theta}_E}^{1}\theta f(\theta)d\theta > b\frac{2-e^{-q_E}-e^{-q_H}}{2}\int_{\bar{\theta}}^{\bar{\theta}_E}\theta f(\theta)d\theta,$$

or

$$\frac{1}{2}\int_{\bar{\theta}}^{\bar{\theta}_E}[z-a-b\theta(1-e^{-q_E})]f(\theta)d\theta + \frac{1}{2}\int_{\bar{\theta}}^{\bar{\theta}_E}[z-a-b\theta(1-e^{-q_H})]f(\theta)d\theta$$
$$+ b\frac{e^{-q_H}-e^{-q_E}}{2}\int_{\bar{\theta}_E}^{1}\theta f(\theta)d\theta > 0,$$

or

$$\int_{\bar{\theta}}^{\bar{\theta}_E} \left[z - a - b\theta \left(1 - \frac{e^{-q_E} + e^{-q_H}}{2} \right) \right] f(\theta)\, d\theta + b \frac{e^{-q_H} - e^{-q_E}}{2} \int_{\bar{\theta}_E}^{1} \theta f(\theta)\, d\theta > 0. \qquad (5)$$

which holds since the first term is non-negative (the integrand is non-negative within the integration range), and the second term is positive since $q_E > q_H$. Note that the first term in equation (5) represents the welfare gain associated with ratings decreasing buying rates: intermediate-skill subjects with $\theta \in \left[\bar{\theta}, \bar{\theta}_E\right]$ who would have bought a quiz in the absence of ratings, choose the outside option. The second term in equation (5) represents the welfare gain associate with ratings increasing matching rates: high-skill subjects with $\theta \in \left[\bar{\theta}_E, 1\right]$ who would have bought the hard quiz in the absence of ratings, buy the easy quiz.

Proof of Proposition 2: We start by deriving the average payoff for a heterogeneous-taste market without ratings (baseline). In this situation, subjects choose between a safe outside option or purchasing one of two quizzes but do not have access to ratings. Hence, a subject of type j and skill θ prefers to buy a quiz instead of taking the outside option when

$$E[I(\mu, \tau^2, \theta)] > z,$$

or

$$a + b\theta(1 - e^{-\mu + \frac{\tau^2}{2}}) > z,$$

or

$$\theta > \frac{z-a}{b} \frac{1}{1 - e^{-\mu + \frac{\tau^2}{2}}} = \bar{\theta}.$$

The average payoff of subjects who select to take a quiz take has to take into account that one quiz is for the young and the other quiz is for the old. Since we assume subjects assign the same prior mean quality to both quizzes it follows that, in the absence of ratings, half of the young choose the young quiz and the other half choose the old quiz. Similarly, half of the old choose the young quiz and the other half choose the old quiz. The average payoff of the young who select to take a quiz in the heterogeneous-taste baseline is

$$\begin{aligned} E[I_{HETY}(\text{Baseline})|\theta \;&>\; \bar{\theta}] = \frac{1}{\Pr(\theta > \bar{\theta})} \left[\frac{1}{2} \int_{\bar{\theta}}^{1} E[U(q_{YY}, \theta) f(\theta) d\theta + \frac{1}{2} \int_{\bar{\theta}}^{1} E[U(q_{OY}, \theta) f(\theta) d\theta \right] \\ &= \frac{1}{2\left[1 - F(\bar{\theta})\right]} \left[\int_{\bar{\theta}}^{1} (a + b\theta(1 - e^{-q_{YY}}) f(\theta) d\theta + \int_{\bar{\theta}}^{1} (a + b\theta(1 - e^{-q_{OY}}) f(\theta) d\theta \right] \\ &= a + b \frac{2 - e^{-q_{YY}} - e^{-q_{OY}}}{2\left[1 - F(\bar{\theta})\right]} \int_{\bar{\theta}}^{1} \theta f(\theta) d\theta. \end{aligned}$$

The overall average payoff of the young in the heterogeneous-taste baseline is

$$\begin{aligned}
E[I_{HETY}(\text{Baseline})] &= \Pr(\theta < \bar{\theta})z + \Pr(\theta > \bar{\theta})E[I_{HETY}(\text{Baseline})|\theta > \bar{\theta}] \\
&= F(\bar{\theta})z + \left[1 - F(\bar{\theta})\right] a + b\frac{2 - e^{-q_{YY}} - e^{-q_{OY}}}{2} \int_{\bar{\theta}}^{1} \theta f(\theta) d\theta. \\
&= a + (z-a)F(\bar{\theta}) + b\frac{2 - e^{-q_{YY}} - e^{-q_{OY}}}{2} \int_{\bar{\theta}}^{1} \theta f(\theta) d\theta.
\end{aligned}$$

The average payoff of the old who select to take a quiz in the heterogeneous-taste baseline is

$$\begin{aligned}
E[I_{HETO}(\text{Baseline})|\theta &> \bar{\theta}] = \frac{1}{\Pr(\theta > \bar{\theta})}\left[\frac{1}{2}\int_{\bar{\theta}}^{1} E[U(q_{YO},\theta)f(\theta)d\theta + \frac{1}{2}\int_{\bar{\theta}}^{1} E[U(q_{OO},\theta)f(\theta)d\theta\right] \\
&= a + b\frac{2 - e^{-q_{YO}} - e^{-q_{OO}}}{2\left[1 - F(\bar{\theta})\right]} \int_{\bar{\theta}}^{1} \theta f(\theta) d\theta.
\end{aligned}$$

The overall average payoff of the old in the heterogeneous-taste baseline is

$$\begin{aligned}
E[I_{HETO}(\text{Baseline})] &= \Pr(\theta < \bar{\theta})z + \Pr(\theta > \bar{\theta})E[I_{HETO}(\text{Baseline})|\theta > \bar{\theta}] \\
&= F(\bar{\theta})z + \left[1 - F(\bar{\theta})\right] a + b\frac{2 - e^{-q_{YO}} - e^{-q_{OO}}}{2} \int_{\bar{\theta}}^{1} \theta f(\theta) d\theta \\
&= a + (z-a)F(\bar{\theta}) + b\frac{2 - e^{-q_{YO}} - e^{-q_{OO}}}{2} \int_{\bar{\theta}}^{1} \theta f(\theta) d\theta.
\end{aligned}$$

Hence, the overall average payoff of all subjects in the heterogeneous-taste baseline is

$$\begin{aligned}
E[I_{HET}(\text{Baseline})] &= \alpha E[I_{HETY}(\text{Baseline})] + (1-\alpha)E[I_{HETO}(\text{Baseline})] \\
&= a + (z-a)F(\bar{\theta}) + \alpha\frac{b}{2}(2 - e^{-q_{YY}} - e^{-q_{OY}}) \int_{\bar{\theta}}^{1} \theta f(\theta) d\theta \\
&\quad + (1-\alpha)\frac{b}{2}(2 - e^{-q_{YO}} - e^{-q_{OO}}) \int_{\bar{\theta}}^{1} \theta f(\theta) d\theta \\
&= a + (z-a)F(\bar{\theta}) + \frac{b}{2}\left[1 - \alpha e^{-q_{YY}} - (1-\alpha)e^{-q_{YO}}\right] \int_{\bar{\theta}}^{1} \theta f(\theta) d\theta \\
&\quad + \frac{b}{2}\left[1 - \alpha e^{-q_{OY}} - (1-\alpha)e^{-q_{OO}}\right] \int_{\bar{\theta}}^{1} \theta f(\theta) d\theta. \qquad (6)
\end{aligned}$$

Now we consider what happens in a heterogeneous-taste market with ratings. Ratings of the young quiz provided by young subjects are drawn from $N(q_{YY}, \sigma^2)$, while ratings of the young quiz provided by old subjects are drawn from $N(q_{YO}, \sigma^2)$. It follows that, in a large sample of ratings in which a fraction α is contributed by young subjects and a fraction

$1-\alpha$ by old subjects, the mean rating of the young quiz, $\bar{r}_Y$, converges in probability to

$$q_Y = \alpha q_{YY} + (1-\alpha) q_{YO}.$$

Similarly, in a large sample with the same composition, the mean rating of the old quiz, $\bar{r}_O$, converges in probability to

$$q_O = \alpha q_{OY} + (1-\alpha) q_{OO}.$$

When $q_Y > q_O$ subjects either choose the young quiz or the outside option. Using the model, a subject prefers the young quiz to the outside option when

$$E[I(q_Y, \theta)] = a + b\theta(1 - e^{-q_Y}) > z,$$

or

$$\theta > \frac{z-a}{b} \frac{1}{1-e^{-q_Y}} = \bar{\theta}_Y.$$

The average payoff of young subjects who buy the young quiz is

$$E[I_{HETY}(\text{Ratings}) | \theta > \bar{\theta}_Y] = a + b\frac{1-e^{-q_{YY}}}{1-F(\bar{\theta}_Y)} \int_{\bar{\theta}_Y}^{1} \theta f(\theta) d\theta.$$

The overall average payoff of young subjects in a heterogeneous-taste market with ratings is

$$\begin{aligned} E[I_{HETY}(\text{Ratings})] &= \Pr(\theta < \bar{\theta}_Y) z + \Pr(\theta > \bar{\theta}_Y) \left[a + b\frac{1-e^{-q_{YY}}}{1-F(\bar{\theta}_Y)} \int_{\bar{\theta}_Y}^{1} \theta f(\theta) d\theta \right] \\ &= F(\bar{\theta}_Y) z + \left[1 - F(\bar{\theta}_Y)\right] a + b(1-e^{-q_{YY}}) \int_{\bar{\theta}_Y}^{1} \theta f(\theta) d\theta \\ &= a + (z-a) F(\bar{\theta}_Y) + b(1-e^{-q_{YY}}) \int_{\bar{\theta}_Y}^{1} \theta f(\theta) d\theta. \end{aligned}$$

The average payoff of old subjects who buy the young quiz is

$$E[I_{HETO}(\text{Ratings}) | \theta > \bar{\theta}_Y] = a + b\frac{1-e^{-q_{YO}}}{1-F(\bar{\theta}_Y)} \int_{\bar{\theta}_Y}^{1} \theta f(\theta) d\theta.$$

The overall average payoff of old subjects in a heterogeneous-taste market with ratings is

$$\begin{aligned} E[I_{HETO}(\text{Ratings})] &= \Pr(\theta < \bar{\theta}_Y)z + \Pr(\theta > \bar{\theta}_Y)\left[a + b\frac{1-e^{-q_{YO}}}{1-F(\bar{\theta}_Y)}\int_{\bar{\theta}_Y}^{1}\theta f(\theta)d\theta\right] \\ &= F(\bar{\theta}_Y)z + \left[1 - F(\bar{\theta}_Y)\right]a + b(1-e^{-q_{YO}})\int_{\bar{\theta}_Y}^{1}\theta f(\theta)d\theta \\ &= a + (z-a)F(\bar{\theta}_Y) + b(1-e^{-q_{YO}})\int_{\bar{\theta}_Y}^{1}\theta f(\theta)d\theta. \end{aligned}$$

Hence, the overall average payoff of all subjects in a heterogeneous-taste market with ratings is

$$\begin{aligned} E[I_{HET}(\text{Ratings})] &= \alpha E[I_{HETY}(\text{Ratings})] + (1-\alpha)E[I_{HETO}(\text{Ratings})] \\ &= \alpha\Big[a + (z-a)F(\bar{\theta}_Y) + b(1-e^{-q_{YY}})\int_{\bar{\theta}_Y}^{1}\theta f(\theta)\,d\theta\Big] \\ &\quad + (1-\alpha)\Big[a + (z-a)F(\bar{\theta}_Y) + b(1-e^{-q_{YO}})\int_{\bar{\theta}_Y}^{1}\theta f(\theta)\,d\theta\Big] \\ &= a + (z-a)F(\bar{\theta}_Y) + b\Big[1 - \alpha e^{-q_{YY}} - (1-\alpha)e^{-q_{YO}}\Big]\int_{\bar{\theta}_Y}^{1}\theta f(\theta)\,d\theta. \end{aligned} \tag{7}$$

Using equations (6) and (7), we have that

$$E[I_{HET}(\text{Ratings})] > E[I_{HET}(\text{Baseline})],$$

or

$$\begin{aligned} &a + (z-a)F(\bar{\theta}_Y) + b\left[1 - \alpha e^{-q_{YY}} - (1-\alpha)e^{-q_{YO}}\right]\int_{\bar{\theta}_Y}^{1}\theta f(\theta)d\theta > \\ &\qquad a + (z-a)F(\bar{\theta}) + \frac{b}{2}\left[1 - \alpha e^{-q_{YY}} - (1-\alpha)e^{-q_{YO}}\right]\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta \\ &\qquad\qquad + \frac{b}{2}\left[1 - \alpha e^{-q_{OY}} - (1-\alpha)e^{-q_{OO}}\right]\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta. \end{aligned}$$

We consider two separate cases. In the first case, (a), we consider $q_{YO} + \tau^2/2 \leq \mu < q_Y + \tau^2/2$, i.e., prior beliefs about quiz quality are relatively low. In the second case, (b), we consider $q_Y + \tau^2/2 \leq \mu \leq q_{YY} + \tau^2/2$, i.e., prior beliefs about quiz quality are relatively high.

(a) Assume $q_{YO} + \tau^2/2 \leq \mu < q_Y + \tau^2/2$. When $q_Y > \mu - \tau^2/2$, $\bar{\theta} = \frac{z-a}{b}\frac{1}{1-e^{-\mu+\tau^2/2}}$, and $\bar{\theta}_Y = \frac{z-a}{b}\frac{1}{1-e^{-q_Y}}$ imply $\bar{\theta} > \bar{\theta}_Y$. Hence, we can write $E[I_{HET}(\text{Ratings})] > E[I_{HET}(\text{Baseline})]$ as

$$\alpha \int_{\bar{\theta}_Y}^{\bar{\theta}} \left[a + b\theta(1 - e^{-q_{YY}}) - z\right] f(\theta)d\theta + (1-\alpha) \int_{\bar{\theta}_Y}^{\bar{\theta}} \left[a + b\theta(1 - e^{-q_{YO}}) - z\right] f(\theta)d\theta$$
$$+ \alpha\frac{b}{2}(e^{-q_{OY}} - e^{-q_{YY}}) \int_{\bar{\theta}}^{1} \theta f(\theta)d\theta - (1-\alpha)\frac{b}{2}(e^{-q_{YO}} - e^{-q_{OO}}) \int_{\bar{\theta}}^{1} \theta f(\theta)d\theta > 0. \quad (8)$$

The first term in equation (8) is non-negative given that the integrand is non-negative (within the integration range). The second term is non-positive since $q_{YO} + \tau^2/2 \leq \mu$ implies the integrand is non-positive (within the integration range). The third term is positive since $q_{YY} > q_{OY}$, and the fourth term is negative since $q_{OO} > q_{YO}$. Note that the first term in equation (8) captures the welfare gain from ratings through higher buying rates among the young: intermediate-skill young subjects with $\theta \in (\bar{\theta}_Y, \bar{\theta})$ who would have chosen the outside option in the absence of ratings now purchase the young quiz. The second term in (8) captures the welfare loss from ratings through higher buying rates among the old: intermediate-skill old subjects with $\theta \in (\bar{\theta}_Y, \bar{\theta})$ who would have chosen the outside option in the absence of ratings now purchase the young quiz. The third term in equation (8) captures the welfare gain from ratings through higher matching rates among the young: high-skill young subjects with $\theta \in (\bar{\theta}, 1)$ who would have chosen the old quiz in the absence of ratings now purchase the young quiz. Finally, the fourth term in equation (8) captures the welfare loss from ratings through lower matching rates among the old: high-skill old subjects with $\theta \in (\bar{\theta}, 1)$ who would have chosen the old quiz in the absence of ratings now purchase the young quiz.

(b) Assume $q_Y + \tau^2/2 \leq \mu \leq q_{YY} + \tau^2/2$. When $q_Y \leq \mu - \tau^2/2$, $\bar{\theta} = \frac{z-a}{b}\frac{1}{1-e^{-\mu+\tau^2/2}}$, and $\bar{\theta}_Y = \frac{z-a}{b}\frac{1}{1-e^{-q_Y}}$ imply $\bar{\theta} \leq \bar{\theta}_Y$. Hence, we can write $E[I_{HET}(\text{Ratings})] > E[I_{HET}(\text{Baseline})]$ as

$$\alpha \int_{\bar{\theta}}^{\bar{\theta}_Y} \left[z - a - b\theta(1 - e^{-q_{YY}})\right] f(\theta)d\theta + (1-\alpha) \int_{\bar{\theta}}^{\bar{\theta}_Y} \left[z - a - b\theta(1 - e^{-q_{YO}})\right] f(\theta)d\theta$$
$$+ \alpha\frac{b}{2}(e^{-q_{OY}} - e^{-q_{YY}}) \int_{\bar{\theta}_Y}^{1} \theta f(\theta)d\theta - (1-\alpha)\frac{b}{2}(e^{-q_{YO}} - e^{-q_{OO}}) \int_{\bar{\theta}_Y}^{1} \theta f(\theta)d\theta > 0. \quad (9)$$

The first term in equation (9) is non-positive since $\mu \leq q_{YY} + \tau^2/2$ implies that the integrand is non-positive (within the integration range). The second term is non-negative since the integrand is non-negative (within the integration range). The third term is positive since $q_{YY} > q_{OY}$, and the fourth term is negative since $q_{OO} > q_{YO}$. Note that the first term in equation (9) captures the welfare loss from ratings through lower buying rates among the young: intermediate-skill young subjects with $\theta \in (\bar{\theta}, \bar{\theta}_Y)$ who would have purchased the young quiz in the absence of ratings now chose the outside option. The second term in (9) captures the welfare gain from ratings through lower buying rates among the old:

intermediate-skill old subjects with $\theta \in (\bar{\theta}, \bar{\theta}_Y)$ who would have purchased the young quiz in the absence of ratings now chose the outside option. The third term in equation (9) captures the welfare gain from ratings through higher matching rates among the young: high-skill young subjects with $\theta \in (\bar{\theta}_Y, 1)$ who would have chosen the old quiz in the absence of ratings now purchase the young quiz. Finally, the fourth term in equation (9) captures the welfare loss from ratings through lower matching rates among the old: high-skill old subjects with $\theta \in (\bar{\theta}_Y, 1)$ who would have chosen the old quiz in the absence of ratings now purchase the young quiz.

Proof of Proposition 3: We start by deriving the average payoff for a heterogeneous-taste market with ratings enhanced by filtering. We focus on a situation where, after many ratings accumulate, young and old know which quiz is best for the young and which is best for the old.
A young subject who wishes to decide between the two quizzes uses the most informative signal. Hence, he compares the ratings young subjects attribute to the young and old quizzes ignoring the ratings of old subjects. The weak law of large numbers implies

$$\bar{r}_{YY} \xrightarrow{p} q_{YY} \text{ and } \bar{r}_{OY} \xrightarrow{p} q_{OY}.$$

This together with equation (3) implies

$$E(q_{YY}|\bar{r}_{YY}) \xrightarrow{p} q_{YY} \text{ and } E(q_{OY}|\bar{r}_{OY}) \xrightarrow{p} q_{OY}.$$

Since $q_{YY} > q_{OY}$ young subjects either choose the young quiz or the outside option. What will be the percentages of young subjects making each choice? Using the model, a young subject who knows which is the young quiz prefers it to the outside option when

$$E[I(q_{YY}, \theta)] = a + b\theta(1 - e^{-q_{YY}}) > z,$$

or

$$\theta > \frac{z-a}{b}\frac{1}{1-e^{-q_{YY}}} = \bar{\theta}_{YY}.$$

Similarly, an old subject who wishes to decide between the two quizzes uses the most informative signal. Hence, he compares the ratings old subjects attribute to the young and old quizzes ignoring the ratings of young subjects. The weak law of large numbers implies

$$\bar{r}_{YO} \xrightarrow{p} q_{YO} \text{ and } \bar{r}_{OO} \xrightarrow{p} q_{OO}.$$

This together with equation (3) implies

$$E(q_{YO}|\bar{r}_{YO}) \xrightarrow{p} q_{YO} \text{ and } E(q_{OO}|\bar{r}_{OO}) \xrightarrow{p} q_{OO}.$$

Since $q_{OO} > q_{YO}$ old subjects either choose the old quiz or the outside option. What will be the percentages of old subjects making each choice? Using the model, an old subject who knows which is the old quiz prefers it to the outside option when

$$E[I(q_{OO},\theta)] = a + b\theta(1 - e^{-q_{OO}}) > z,$$

or

$$\theta > \frac{z-a}{b}\frac{1}{1-e^{-q_{OO}}} = \bar{\theta}_{OO}.$$

The average payoff of young subjects who buy the young quiz is

$$E[I_{HETY}(\text{Filtering})|\theta > \bar{\theta}_{YY}] = a + b\frac{1-e^{-q_{YY}}}{1-F(\bar{\theta}_{YY})}\int_{\bar{\theta}_{YY}}^{1}\theta f(\theta)d\theta.$$

The overall average payoff of young subjects in a heterogeneous-taste market with ratings enhanced by filtering is

$$\begin{aligned} E[I_{HETY}(\text{Filtering})] &= \Pr(\theta < \bar{\theta}_{YY})z + \Pr(\theta > \bar{\theta}_{YY})\left[a + b\frac{1-e^{-q_{YY}}}{1-F(\bar{\theta}_{YY})}\int_{\bar{\theta}_{YY}}^{1}\theta f(\theta)d\theta\right] \\ &= F(\bar{\theta}_{YY})z + \left[1 - F(\bar{\theta}_{YY})\right]a + b(1-e^{-q_{YY}})\int_{\bar{\theta}_{YY}}^{1}\theta f(\theta)d\theta \\ &= a + (z-a)F(\bar{\theta}_{YY}) + b(1-e^{-q_{YY}})\int_{\bar{\theta}_{YY}}^{1}\theta f(\theta)d\theta. \end{aligned}$$

The average payoff of old subjects who buy the old quiz is

$$E[I_{HETO}(\text{Filtering})|\theta > \bar{\theta}_{OO}] = a + b\frac{1-e^{-q_{OO}}}{1-F(\bar{\theta}_{OO})}\int_{\bar{\theta}_{OO}}^{1}\theta f(\theta)d\theta.$$

The overall average payoff of old subjects in a heterogeneous-taste market with ratings enhanced by filtering is

$$\begin{aligned} E[I_{HETO}(\text{Filtering})] &= \Pr(\theta < \bar{\theta}_{OO})z + \Pr(\theta > \bar{\theta}_{OO})\left[a + b\frac{1-e^{-q_{OO}}}{1-F(\bar{\theta}_{OO})}\int_{\bar{\theta}_{OO}}^{1}\theta f(\theta)d\theta\right] \\ &= F(\bar{\theta}_{OO})z + \left[1 - F(\bar{\theta}_{OO})\right]a + b(1-e^{-q_{OO}})\int_{\bar{\theta}_{OO}}^{1}\theta f(\theta)d\theta \\ &= a + (z-a)F(\bar{\theta}_{OO}) + b(1-e^{-q_{OO}})\int_{\bar{\theta}_{OO}}^{1}\theta f(\theta)d\theta. \end{aligned}$$

Hence, the overall average payoff of all subjects in a heterogeneous-taste market with ratings enhanced by filtering is

$$\begin{aligned}E[I_{HET}(\text{Filtering})] &= \alpha E[I_{HETY}(\text{Filtering})] + (1-\alpha)E[I_{HETO}(\text{Filtering})]\\ &= \alpha\Big[a + (z-a)F(\bar{\theta}_{YY}) + b(1-e^{-q_{YY}})\int_{\bar{\theta}_{YY}}^{1}\theta f(\theta)\,d\theta\Big]\\ &\quad + (1-\alpha)\Big[a + (z-a)F(\bar{\theta}_{OO}) + b(1-e^{-q_{OO}})\int_{\bar{\theta}_{OO}}^{1}\theta f(\theta)\,d\theta\Big]. \qquad (10)\end{aligned}$$

Using equations (6) and (10), we have that

$$E[I_{HET}(\text{Filtering})] > E[I_{HET}(\text{Baseline})]$$

or

$$\begin{aligned}&a + (z-a)\left[\alpha F(\bar{\theta}_{YY}) + (1-\alpha)F(\bar{\theta}_{OO})\right]\\ &\quad + \alpha b(1-e^{-q_{YY}})\int_{\bar{\theta}_{YY}}^{1}\theta f(\theta)d\theta + (1-\alpha)b(1-e^{-q_{OO}})\int_{\bar{\theta}_{OO}}^{1}\theta f(\theta)d\theta >\\ &\quad a + (z-a)F(\bar{\theta}) + \alpha\frac{b}{2}(1-e^{-q_{YY}})\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta + \alpha\frac{b}{2}(1-e^{-q_{OY}})\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta\\ &\quad + (1-\alpha)\frac{b}{2}(1-e^{-q_{YO}})\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta + (1-\alpha)\frac{b}{2}(1-e^{-q_{OO}})\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta.\end{aligned}$$

We will prove the proposition for the case where prior beliefs about quiz quality are low, i.e., $\min\{q_{YY}, q_{OO}\} > \mu - \tau^2/2$. The proofs for the case where prior beliefs about quiz quality are high, i.e., $\max\{q_{YY}, q_{OO}\} < \mu - \tau^2/2$, and for all other kinds of prior beliefs, can be derived using an analogous approach.

When $q_{YY} > \mu - \tau^2/2$, $\bar{\theta} = \frac{z-a}{b}\frac{1}{1-e^{-\mu+\tau^2/2}}$, and $\bar{\theta}_{YY} = \frac{z-a}{b}\frac{1}{1-e^{-q_{YY}}}$ imply $\bar{\theta} > \bar{\theta}_{YY}$. Similarly, $q_{OO} > \mu - \tau^2/2$, $\bar{\theta} = \frac{z-a}{b}\frac{1}{1-e^{-\mu+\tau^2/2}}$, and $\bar{\theta}_{OO} = \frac{z-a}{b}\frac{1}{1-e^{-q_{OO}}}$ imply $\bar{\theta} > \bar{\theta}_{OO}$.

$$\begin{aligned}&(z-a)\left[\alpha F(\bar{\theta}_{YY}) + (1-\alpha)F(\bar{\theta}_{OO})\right] + \alpha b(1-e^{-q_{YY}})\left[\int_{\bar{\theta}_{YY}}^{\bar{\theta}}\theta f(\theta)d\theta + \int_{\bar{\theta}}^{1}\theta f(\theta)d\theta\right]\\ &+(1-\alpha)b(1-e^{-q_{OO}})\left[\int_{\bar{\theta}_{OO}}^{\bar{\theta}}\theta f(\theta)d\theta + \int_{\bar{\theta}}^{1}\theta f(\theta)d\theta\right] > (z-a)F(\bar{\theta}) + \alpha\frac{b}{2}(1-e^{-q_{YY}})\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta\\ &+\alpha\frac{b}{2}(1-e^{-q_{OY}})\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta + (1-\alpha)\frac{b}{2}(1-e^{-q_{YO}})\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta + (1-\alpha)\frac{b}{2}(1-e^{-q_{OO}})\int_{\bar{\theta}}^{1}\theta f(\theta)d\theta,\end{aligned}$$

or

$$(z-a)\left[\alpha F(\bar{\theta}_{YY}) + (1-\alpha)F(\bar{\theta}_{OO})\right] + \alpha b(1-e^{-q_{YY}})\int_{\bar{\theta}_{YY}}^{\bar{\theta}} \theta f(\theta)d\theta + \alpha\frac{b}{2}(1-e^{-q_{YY}})\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta$$
$$+ (1-\alpha)b(1-e^{-q_{OO}})\int_{\bar{\theta}_{OO}}^{\bar{\theta}} \theta f(\theta)d\theta + (1-\alpha)\frac{b}{2}(1-e^{-q_{OO}})\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta > (z-a)F(\bar{\theta})$$
$$+ \alpha\frac{b}{2}(1-e^{-q_{OY}})\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta + (1-\alpha)\frac{b}{2}(1-e^{-q_{YO}})\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta,$$

or

$$\alpha b(1-e^{-q_{YY}})\int_{\bar{\theta}_{YY}}^{\bar{\theta}} \theta f(\theta)d\theta + (1-\alpha)b(1-e^{-q_{OO}})\int_{\bar{\theta}_{OO}}^{\bar{\theta}} \theta f(\theta)d\theta + \alpha\frac{b}{2}(e^{-q_{OY}} - e^{-q_{YY}})\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta$$
$$+(1-\alpha)\frac{b}{2}(e^{-q_{YO}} - e^{-q_{OO}})\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta > \alpha(z-a)\left[F(\bar{\theta}) - F(\bar{\theta}_{YY})\right] + (1-\alpha)(z-a)\left[F(\bar{\theta}) - F(\bar{\theta}_{OO})\right],$$

or

$$\alpha\int_{\bar{\theta}_{YY}}^{\bar{\theta}} \left[a + b\theta(1-e^{-q_{YY}}) - z\right] f(\theta)d\theta + (1-\alpha)\int_{\bar{\theta}_{OO}}^{\bar{\theta}} \left[a + b\theta(1-e^{-q_{OO}}) - z\right] f(\theta)d\theta$$
$$+ \alpha\frac{b}{2}(e^{-q_{OY}} - e^{-q_{YY}})\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta + (1-\alpha)\frac{b}{2}(e^{-q_{YO}} - e^{-q_{OO}})\int_{\bar{\theta}}^{1} \theta f(\theta)d\theta > 0, \quad (11)$$

which holds since the first two terms are positive given that the integrands are positive (within the integration range), the third term is positive since $q_{YY} > q_{OY}$, and the fourth term is also positive since $q_{OO} > q_{YO}$. Note that the first term in equation (11) captures the welfare gain from filtering through higher buying rates among the young: intermediate-skill young subjects with $\theta \in (\bar{\theta}_{YY}, \bar{\theta})$ who would have chosen the outside option in the absence of filtering now purchase the young quiz. The second term in equation (11) is the analogous gain for the old: intermediate-skill old subjects with $\theta \in (\bar{\theta}_{OO}, \bar{\theta})$ who would have chosen the outside option without filtering now purchase the old quiz. The third term in equation (11) captures the welfare gain from filtering via improved matching among the young: high-skill young subjects with $\theta \in (\bar{\theta}, 1)$ who would have bought the old quiz without filtering now buy the young quiz. Finally, the fourth term in equation (11) is the symmetric matching gain for the old: high-skill old subjects with $\theta \in (\bar{\theta}, 1)$ who would have bought the young quiz absent filtering now buy the old quiz.

2 Additional Tables and Figures

Table A1: Determinants of earnings for blue and yellow quizzes in heterogeneous-taste baseline

Dependent Variable:	Earnings (£)	
	(Blue)	(Yellow)
Model:	(1)	(2)
Constant	3.637***	2.173***
	(0.345)	(0.631)
Age group = Young	-1.307***	1.640***
	(0.214)	(0.311)
Gender = Male	0.268	0.088
	(0.218)	(0.343)
Confidence (0-100)	-0.006	0.012
	(0.005)	(0.008)
Risk aversion (0-10)	0.111**	-0.002
	(0.044)	(0.066)
Observations	106	44
R^2	0.366	0.426
Adjusted R^2	0.341	0.367

Results of OLS regressions with IID standard-errors in parentheses. Significantly different from zero at 1% (***), 5% (**), 10% (*).

Figure A1: Average earnings in homogeneous and heterogeneous markets by sequence

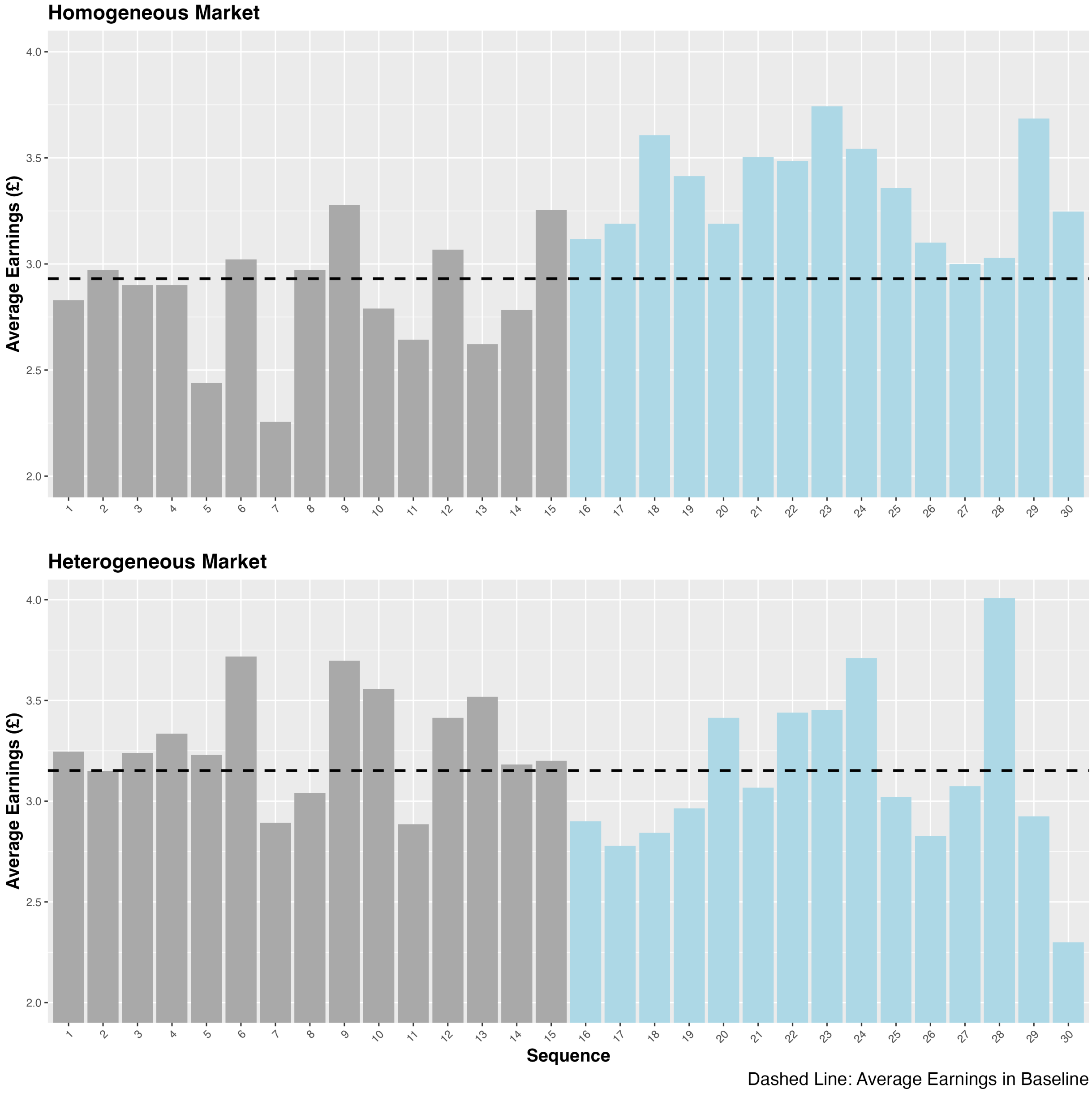

Table A2: Determinants of rating provision

Dependent Variable:	Rater (yes)	
Model:	(1)	(2)
Constant	1.296***	1.170*
	(0.347)	(0.632)
Earnings (£)	0.273***	0.270***
	(0.054)	(0.075)
Age group = Young	-0.160	-0.202
	(0.132)	(0.182)
Risk aversion (0-10)	-0.019	-0.063*
	(0.027)	(0.038)
Confidence (0-100)	-0.003	-0.003
	(0.003)	(0.004)
Gender = Male	0.547***	0.322
	(0.171)	(0.213)
Algorithm	0.439	
	(0.425)	
Baseline Heterogeneous	-0.342	
	(0.290)	
Filtering	-0.071	0.020
	(0.271)	(0.246)
Freezing	0.021	0.289
	(0.275)	(0.310)
Rating Heterogeneous	-0.163	-0.077
	(0.267)	(0.223)
Rating Homogeneous	-0.056	
	(0.272)	
Average rating of selected task		0.072
		(0.126)
Number of ratings of selected task		0.012
		(0.024)
Observations	1,746	1,020
Squared Correlation	0.040	0.031
Pseudo R^2	0.111	0.097
BIC	505.5	301.5

Results of Probit regressions where the dependent variable is a binary indicator equal to 1 if the participant submitted a rating for the quiz and 0 otherwise. Independent variables include participant earnings from the quiz, age group, risk aversion, confidence, gender, the average rating, and number of ratings of the selected quiz at the time of decision. The sample includes only participants who purchased a quiz. Significantly different from zero at 1% (***), 5% (**), 10% (*).

Table A3: Effects of earnings, matching, and risk preferences on rating generosity

Dependent Variable:	Rating (1-5)				
		(All)		(Heterogeneous)	(Homogeneous)
Model:	(1)	(2)	(3)	(4)	(5)
Constant	2.350***	2.463***	2.805***	2.710***	2.783***
	(0.062)	(0.094)	(0.115)	(0.134)	(0.217)
Earnings (£)	0.503***	0.503***	0.479***	0.478***	0.480***
	(0.015)	(0.016)	(0.020)	(0.024)	(0.058)
Algorithm		0.144	0.029	0.086	
		(0.096)	(0.094)	(0.098)	
Baseline Heterogeneous		-0.070	-0.091		
		(0.108)	(0.106)		
Filtering		-0.166*	-0.213**	-0.129	
		(0.086)	(0.085)	(0.088)	
Freezing		-0.315***	-0.362***	-0.274***	
		(0.091)	(0.091)	(0.094)	
Rating Heterogeneous		-0.228**	-0.263***	-0.175*	
		(0.098)	(0.096)	(0.097)	
Rating Homogeneous		0.032	-0.039		0.026
		(0.093)	(0.092)		(0.097)
Match (%)			0.168***	0.240***	-0.018
			(0.048)	(0.072)	(0.118)
Gender = Male			-0.014	0.000	-0.070
			(0.033)	(0.036)	(0.088)
Risk aversion (0-10)			-0.048***	-0.057***	-0.026
			(0.007)	(0.010)	(0.019)
Confidence (0-100)			0.001	0.001	0.001
			(0.001)	(0.001)	(0.002)
Age group = Young			-0.259***	-0.247***	-0.286***
			(0.039)	(0.049)	(0.091)
Observations	1,697	1,697	1,694	1,239	455
R^2	0.348	0.366	0.396	0.439	0.261
Adjusted R^2	0.348	0.363	0.392	0.434	0.249

Results of OLS regressions. Standard errors use the CR2 bias-reduced cluster-robust estimator with Satterthwaite degrees-of-freedom adjustment (?), clustered at the individual level for Baseline treatments and at the sequence level for Rating treatments. Models (1) and (2) include earnings and treatment fixed effects only; models (3)–(5) additionally control for match status, gender, age group, risk aversion, and self-assessed confidence. Models (1), (2), (3), and (5) use the "Homogeneous Baseline" as the reference category for treatment. Model (4) uses the "Heterogeneous Baseline" as the reference. Significantly different from zero at 1% (***), 5% (**), 10% (*).

Table A4: Effect of ratings and individual characteristics on selecting the outside option

Dependent Variable:	Outside Option (%)	
Model:	(1)	(2)
Constant	0.240***	0.464***
	(0.047)	(0.172)
At least 1 rating	0.000	
	(0.034)	
Max average rating		-0.032
		(0.035)
Min average rating		-0.021
		(0.015)
Total number of ratings		-0.002
		(0.002)
Confidence (0-100)	-0.002***	-0.002***
	(0.000)	(0.000)
Risk aversion (0-10)	0.025***	0.023***
	(0.004)	(0.005)
Age group = Young	-0.060***	-0.066**
	(0.016)	(0.027)
Gender = Male	0.084***	0.084**
	(0.023)	(0.039)
Baseline Heterogeneous	-0.024	
	(0.043)	
Filtering	-0.048	-0.061
	(0.054)	(0.038)
Freezing	0.009	-0.002
	(0.048)	(0.043)
Rating Heterogeneous	-0.024	-0.022
	(0.057)	(0.030)
Rating Homogeneous	-0.025	
	(0.052)	
Observations	2,073	1,062
R^2	0.053	0.056
Adjusted R^2	0.048	0.047

Results of OLS regressions with standard errors clustered at the individual level for Baseline treatments and at the independent sequence level for Rating treatments. Includes individual treatment controls. Model (1) considers all observations except those from the Algorithm treatment. Model (2) is restricted to observations where at least 1 rating is made available for each task. Significantly different from zero at 1% (***), 5% (**), 10% (*).

Table A5: Effect of ratings on task choice (Probit)

Dependent Variable:	Task Selected = Blue (%)			
Model:	(1)	(2)	(3)	(4)
Constant	-0.027	-0.013	-0.066	0.119
	(0.137)	(0.133)	(0.128)	(0.168)
Rating gap (Blue − Yellow)	0.424***	0.387***	0.405***	0.278***
	(0.045)	(0.047)	(0.045)	(0.068)
Volume gap (Blue − Yellow)		0.022***	0.038***	0.033***
		(0.006)	(0.005)	(0.005)
Rating gap (Blue − Yellow) × Volume gap (Blue − Yellow)			0.035***	0.039***
			(0.008)	(0.008)
Volume (Blue + Yellow)				-0.013
				(0.010)
Rating gap (Blue − Yellow) × Volume (Blue + Yellow)				0.018**
				(0.008)
Controls	✓	✓	✓	✓
Treatment fixed eff.	✓	✓	✓	✓
Observations	827	827	827	827
Squared Correlation	0.124	0.131	0.138	0.145
Pseudo R^2	0.090	0.095	0.103	0.109
BIC	1,086.9	1,087.8	1,085.7	1,092.0

Results of Probit regressions of an indicator for choosing the Blue quiz on rating regressors, estimated on the sample of purchasers facing two rated quizzes. Rating gap is the difference between the mean ratings of the Blue and Yellow quizzes: $\bar{r}_{\text{Blue}} - \bar{r}_{\text{Yellow}}$. Volume gap is the difference in the number of reviews: $n_{\text{Blue}} - n_{\text{Yellow}}$. Column (3) adds the interaction between the rating gap and the volume gap, testing whether the rating signal carries more weight in choice when Blue is also the option with the highest number of ratings. Column (4) additionally controls for the total number of reviews and its interaction with the rating gap. Controls (gender, age group, risk aversion, and self-assessed task confidence) and treatment fixed effects are included in all specifications but omitted from display. Standard errors use the CR2 bias-reduced cluster-robust estimator with Satterthwaite degrees-of-freedom adjustment (**?**), clustered at the independent-sequence level. Significance: 1% (***), 5% (**), 10% (*).

Table A6: Effect of first unfrozen quiz on later task choice (freezing)

Dependent Variable:	Task Selected = Yellow (%)
Model:	(1)
Constant	-0.561***
	(0.181)
First Unfrozen = Yellow	0.696***
	(0.123)
Confidence (0-100)	0.005**
	(0.002)
Risk aversion (0-10)	-0.021
	(0.023)
Gender = Male	-0.073
	(0.111)
Observations	210
Squared Correlation	0.063
Pseudo R^2	0.046
BIC	293.8

Results of Probit regressions where the dependent variable is an indicator for choosing the Yellow task among the last 15 participants in each sequence. The key explanatory variable is an indicator for whether the Yellow task was the first to unfreeze (i.e., reach the five-rating threshold). Controls include self-assessed confidence, risk preferences, and gender. Standard errors are clustered at the sequence level. Significantly different from zero at 1% (***), 5% (**), 10% (*).

3 Instructions (Qualtrics)

Figure A2: Welcome

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Welcome, we are pleased to see you. You are invited to take part in a research study. The study is administered by researchers at the University of Lausanne. You will receive a minimum of £0.8 and will be able to earn up to £5.3 depending on your choices and performance. Total duration of the study is 4 to 6 minutes. Please note that participation in this study is entirely voluntary and that you may discontinue participation at any time. In this case, you will not be compensated. All data will be treated confidentially. Data will be used in anonymized way for academic research only. Anonymized data will be made available to other researchers for replication purposes.

*IMPORTANT: If you've already participated in UNIL's QUIZ study previously, please do not participate again. Duplicate entries will be checked and will not be compensated or eligible any bonus.

- ○ Yes I want to participate
- ○ No I don't want to participate

Figure A3: Self Reported Confidence

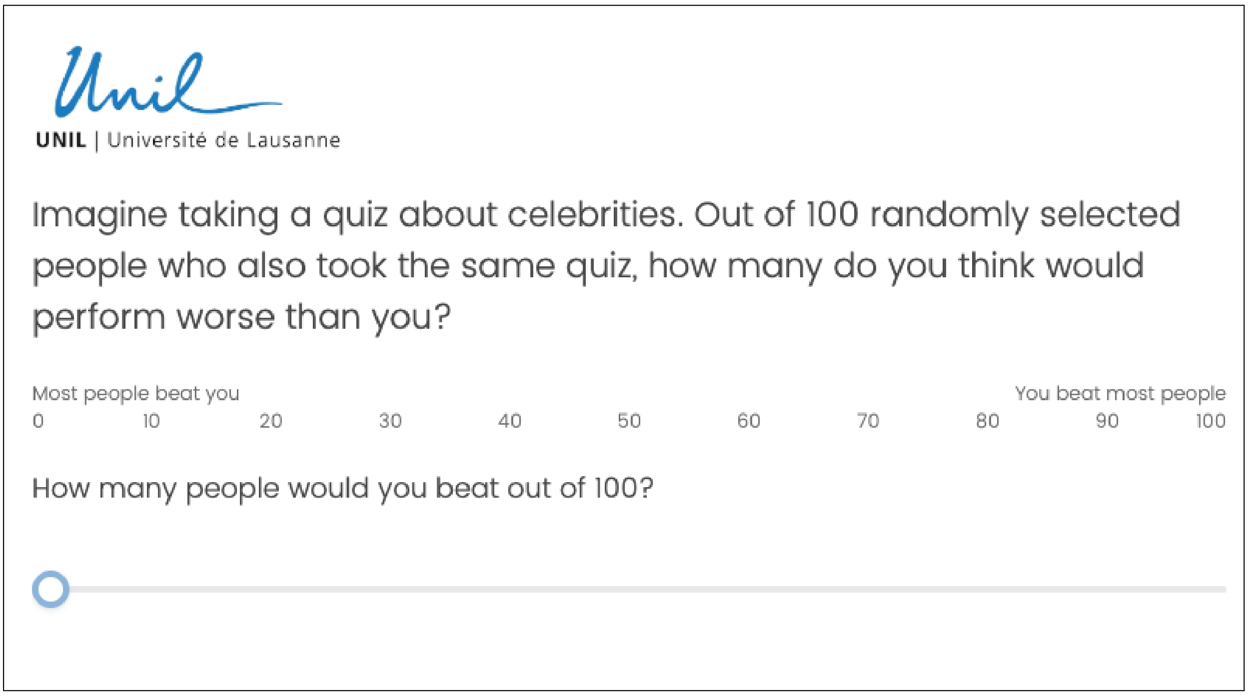

Figure A4: Main Instructions 1

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Let's get started!

Please read the following instructions carefully, as your choice will influence how much money you can earn. You will receive £2.50 for participating. You have the choice of purchasing one of two quizzes or participating in a counting task.

Each quiz consists of ten questions, each with six possible answers. A quiz lasts 110 seconds, with 11 seconds for each question. The cost to participate in a quiz is £1.70, but for each correct answer, you earn a reward of £0.45. This means that if you get 0 answers you still get £0.8 (2.5 - 1.7 + 0*0.45). If you get 10 correct answers, you will be earning £5.3 (2.5 - 1.7 + 10*0.45). The table below shows the possible payments depending on the number of correct answers.

Alternatively, you can participate in a counting task, which also lasts 110 seconds. Participation is free, but there is no reward, meaning you keep your initial £2.50.

Figure A5: Main Instructions 2

Correct answers	£ reward
0	0.8
1	1.25
2	1.7
3	2.15
4	2.6
5	3.05
6	3.5
7	3.95
8	4.4
9	4.85
10	5.3

*Note: £1 ≈ $1.25

Figure A6: Choice Table

Below you can find a table summarizing the choices you can make. Please select one option. Note that earlier participants had the opportunity to rate quizzes on a 1-5 scale. The table displays both the average rating and the number of reviews (indicated in parentheses).

	Quiz BLUE	**Quiz YELLOW**	**Counting Task**
Topic	Celebrities (cinema, music, politics, sports, ...)	Celebrities (cinema, music, politics, sports, ...)	Counting zeros in tables
Time	110s	110s	110s
Possible £ outcome	£0.8-£5.3	£0.8-£5.3	£2.5
Average rating from previous participants	3.3 (6)	4.6 (16)	

Which Quiz/Task would you like to enter

- ◯ Quiz YELLOW
- ◯ Quiz BLUE
- ◯ Counting Zeros

Figure A7: Instruction Quiz

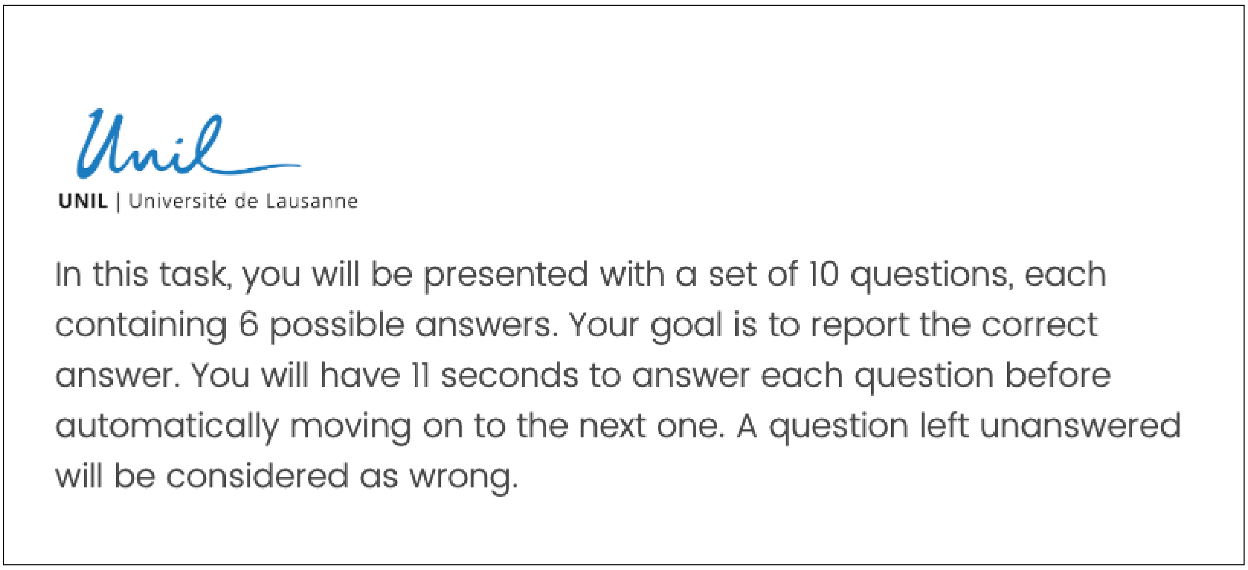

Figure A8: Instruction Counting Zeros

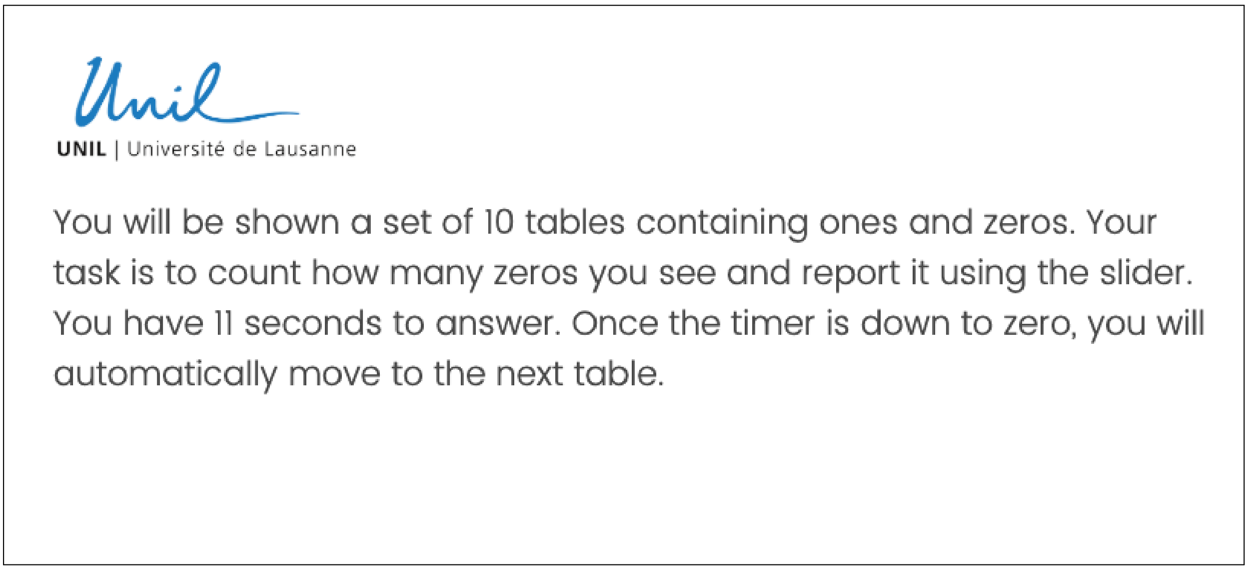

Figure A9: Example Counting Zeros

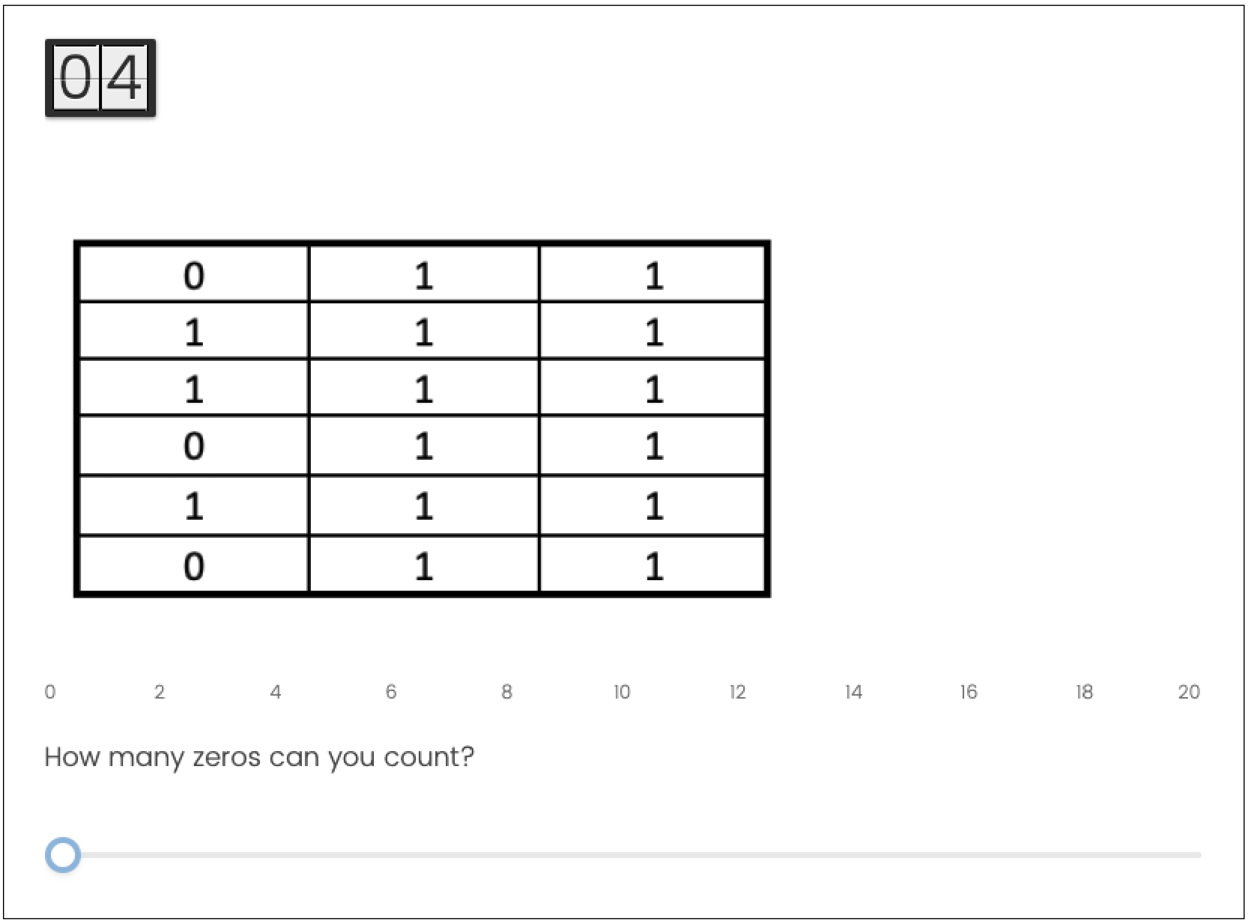

Figure A10: Rating Stage

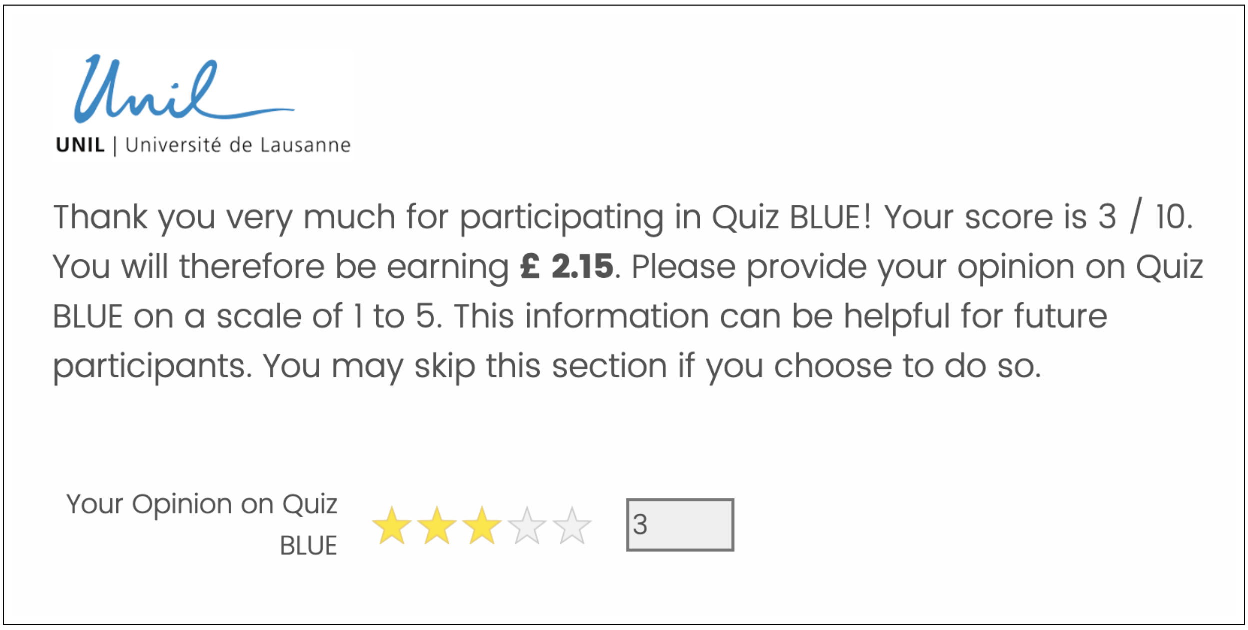

Figure A11: Risk Aversion