ONLINE APPENDIX FOR "TIE-BREAKING AND EFFICIENCY IN THE LABORATORY SCHOOL CHOICE"[†]

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In this Online Appendix, we provide additional arguments and analysis that were omitted from our paper. Section 1 concerns the proofs of Propositions 4 and 8 in our paper. Section 2 characterizes the preference profiles (up to permutations) of students for which DA produces an inefficient matching with a positive probability. Section 3 concerns the equilibrium outcomes for DA, CADA, and SIC when students' preferences are given by Profile 3. Section 4 includes additional figures and tables regarding experimental data. Sections 5 and 6 present the experimental instructions for DA-B and SIC-B treatments, respectively.

1. Regarding Proofs of Propositions 4 and 8

1.1. On Proposition 4. The proof of Proposition 4 in our paper omits assignments produced by the SIC mechanism when students play a strategy profile $s \equiv (s_1, s_2, s_3) \in \{bac, bca, cba\} \times \{acb, cab, cba\} \times \{abc, bac, bca\}$. The assignments as calculated by an oTree simulation are as follows. If $s_3 = abc$, then the assignments are[1]:

		s_2		
		acb	cab	cba
	bac	$\frac{1}{4}(b,a,c) + \frac{3}{4}(b,c,a)$	(b,c,a)	(b,c,a)
s_1	bca	$\frac{1}{4}(b,a,c) + \frac{1}{2}(b,c,a) + \frac{1}{4}(c,a,b)$	(b,c,a)	(b,c,a)
	cba	$\frac{1}{4}(b,c,a) + \frac{1}{2}(c,a,b) + \frac{1}{4}(c,b,a)$	$\frac{1}{2}(b,c,a) + \frac{1}{4}(c,a,b) + \frac{1}{4}(c,b,a)$	$\frac{1}{2}(b,c,a) + \frac{1}{2}(c,b,a)$

If $s_3 = bac$, then the assignments are:

		s_2		
		acb	cab	cba
	bac	$\frac{1}{2}(a,c,b) + \frac{1}{4}(b,a,c) + \frac{1}{4}(b,c,a)$	$\frac{1}{2}(a,c,b) + \frac{1}{2}(b,c,a)$	$\frac{1}{2}(a,c,b) + \frac{1}{2}(b,c,a)$
s_1	bca	$\frac{1}{4}(b,a,c) + \frac{1}{4}(b,c,a) + \frac{1}{2}(c,a,b)$	$\frac{1}{4}(a,c,b) + \frac{1}{2}(b,c,a) + \frac{1}{4}(c,a,b)$	$\frac{1}{4}(a,c,b) + \frac{3}{4}(b,c,a)$
	cba	(c,a,b)	$\frac{1}{4}(a,c,b) + \frac{1}{4}(b,c,a) + \frac{1}{2}(c,a,b)$	$\frac{1}{4}(a,c,b) + \frac{1}{4}(b,c,a) + \frac{1}{2}(c,b,a)$

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[1]In the table, assignemt (b,c,a), for instance, means $\begin{pmatrix} 1 & 2 & 3 \\ b & c & a \end{pmatrix}$.

Finally, if $s_3 = bca$, then the assignments are:

		s_2		
		acb	cab	cba
	bac	$\frac{1}{2}(a,c,b)+\frac{1}{2}(b,a,c)$	$\frac{1}{2}(a,c,b)+\frac{1}{2}(b,a,c)$	(a,c,b)
s_1	bca	$\frac{1}{2}(b,a,c)+\frac{1}{2}(c,a,b)$	$\frac{1}{4}(a,c,b)+\frac{1}{2}(b,a,c)+\frac{1}{4}(c,a,b)$	(a,c,b)
	cba	(c,a,b)	$\frac{1}{4}(a,c,b)+\frac{3}{4}(c,a,b)$	(a,c,b)

Of the strategy profiles considered in the above three tables, only those in $\{(s_1', cba, bca) : s_1' \in \{bac, bca, cba\}\}$ are Nash equilibria.[2]

1.2. On Proposition 8. The proof of Proposition 8 in our paper omits assignments produced by the SIC mechanism when students play a strategy profile $s \equiv (s_1, s_2, s_3) \in \{bac, bca, cab, cba\} \times \{abc, acb, cab, cba\} \times \{abc, bac, bca\}$. The assignments as calculated by an oTree simulation are as follows. If $s_3 = abc$, the assignments are:

		s_2			
		abc	acb	cab	cba
	bac	(b,a,c)	$\frac{1}{4}(b,a,c)+\frac{3}{4}(b,c,a)$	(b,c,a)	(b,c,a)
s_1	bca	$\frac{1}{4}(b,a,c)+\frac{1}{4}(c,a,b)+\frac{1}{2}(c,b,a)$	$\frac{1}{4}(b,a,c)+\frac{1}{2}(b,c,a)+\frac{1}{4}(c,a,b)$	(b,c,a)	(b,c,a)
	cab	$\frac{1}{2}(c,a,b)+\frac{1}{2}(c,b,a)$	$\frac{3}{4}(c,a,b)+\frac{1}{4}(c,b,a)$	$\frac{1}{2}(a,c,b)+\frac{1}{4}(c,a,b)+\frac{1}{4}(c,b,a)$	$\frac{1}{2}(a,c,b)+\frac{1}{2}(c,b,a)$
	cba	$\frac{1}{2}(c,a,b)+\frac{1}{2}(c,b,a)$	$\frac{1}{4}(b,c,a)+\frac{1}{2}(c,a,b)+\frac{1}{4}(c,b,a)$	$\frac{1}{2}(b,c,a)+\frac{1}{4}(c,a,b)+\frac{1}{4}(c,b,a)$	$\frac{1}{2}(b,c,a)+\frac{1}{2}(c,b,a)$

If $s_3 = bac$, the assignments are:

		s_2			
		abc	acb	cab	cba
	bac	(b,a,c)	$\frac{1}{2}(a,c,b)+\frac{1}{4}(b,a,c)+\frac{1}{4}(b,c,a)$	$\frac{1}{2}(a,c,b)+\frac{1}{2}(b,c,a)$	$\frac{1}{2}(a,c,b)+\frac{1}{2}(b,c,a)$
s_1	bca	$\frac{1}{4}(b,a,c)+\frac{3}{4}(c,a,b)$	$\frac{1}{4}(b,a,c)+\frac{1}{4}(b,c,a)+\frac{1}{2}(c,a,b)$	$\frac{1}{4}(a,c,b)+\frac{1}{2}(b,c,a)+\frac{1}{4}(c,a,b)$	$\frac{1}{4}(a,c,b)+\frac{3}{4}(b,c,a)$
	cab	(c,a,b)	(c,a,b)	$\frac{1}{2}(a,c,b)+\frac{1}{2}(c,a,b)$	$\frac{1}{2}(a,c,b)+\frac{1}{2}(c,b,a)$
	cba	(c,a,b)	(c,a,b)	$\frac{1}{4}(a,c,b)+\frac{1}{4}(b,c,a)+\frac{1}{2}(c,a,b)$	$\frac{1}{4}(a,c,b)+\frac{1}{4}(b,c,a)+\frac{1}{2}(c,b,a)$

If $s_3 = bca$, the assignments are:

		s_2			
		abc	acb	cab	cba
	bac	(b,a,c)	$\frac{1}{2}(a,c,b)+\frac{1}{2}(b,a,c)$	$\frac{1}{2}(a,c,b)+\frac{1}{2}(b,a,c)$	(a,c,b)
s_1	bca	$\frac{1}{2}(b,a,c)+\frac{1}{2}(c,a,b)$	$\frac{1}{2}(b,a,c)+\frac{1}{2}(c,a,b)$	$\frac{1}{4}(a,c,b)+\frac{1}{2}(b,a,c)+\frac{1}{4}(c,a,b)$	(a,c,b)
	cab	(c,a,b)	(c,a,b)	$\frac{1}{2}(a,c,b)+\frac{1}{2}(c,a,b)$	(a,c,b)
	cba	(c,a,b)	(c,a,b)	$\frac{1}{4}(a,c,b)+\frac{3}{4}(c,a,b)$	(a,c,b)

Of the strategy profiles considered in the above three tables, only those in $\{(s_1', cba, bca) : s_1' \in \{bac, bca, cab, cba\}\}$ are Nash equilibria.

[2]These are *ordinal* Nash equilibria because, e.g., bac is student 1's best response to (cba, bca) in the first-order stochastic dominance sense.

2. Preference Profiles for Which DA Is Inefficient

In this appendix, we prove the following statement discussed in Section 1.

Claim: Assume that $N = \{1, 2, 3\}$ and $A = \{a, b, c\}$. Let $\succsim$ be a priority profile such that $1 \succ_a 2 \sim_a 3$, $2 \succ_b 1 \sim_b 3$, and $3 \succ_c 1 \sim_c 2$. Let $q \equiv (1, 1, 1)$. For each $R \in \mathcal{R}^N$, if $DA(R, \succsim, q)$ produces an inefficient assignment with a positive probability, then R is symmetric to one of the three profiles in Section 1.

Throughout the appendix, we assume that N, A, $\succsim$, and q are as defined in the claim. Applying a theorem by **?** to DA, it follows that for each $R \in \mathcal{R}^N$, $DA(R, \succsim, q)$ is inefficient if and only if there is a tie-breaker $\succ'$ of $\succsim$ such that $DA(R, \succ', q)$ admits a stable improvement cycle. Therefore, it is enough to identify preference profiles for which a stable improvement cycle exists with a positive probability when DA is applied.

First, we show that a stable improvement cycle never involves three students.

Lemma 1. *There do not exist a preference profile $R \in \mathcal{R}^N$ and a tie-breaker $\succ'$ of $\succsim$ such that $DA(R, \succ', q)$ admits a stable improvement cycle involving three students.*

Proof. Let $R \in \mathcal{R}^N$. Let $\succ'$ be a tie-breaker of $\succsim$. Suppose, by contradiction, that $DA(R, \succ', q)$ admits a stable improvement cycle involving three students. Enumerate students as i_1, i_2, and i_3. For each $k \in \{1, 2, 3\}$, let $a_k \equiv DA_{i_k}(R, \succ', q)$ be the school assigned to i_k. We proceed in two steps.

Step 1: *There is at least one student, say i_1, such that a_1 is least preferred according to R_{i_1}. Further, i_1 has the highest priority at a_1.*

Suppose, by contradiction, that each student i is assigned his first or second choice according to R_i. Because the stable improvement cycle involves three students, this implies that according to R, the students' first choices are distinct. Then DA assigns to each student i his top choice according to R_i and a stable improvement cycle does not exist, a contradiction.

Thus, at least one student, say i_1, is assigned his third choice (which is a_1). Student i_1 can be rejected by schools a_2 and a_3 only if he does not have the top priority at either school. Because i_1 has the top priority at one school, that must be a_1.

Step 2: *Assume, without loss of generality, that $R_{i_1} = a_3 a_2 a_1$. Then regardless of whether $a_3 \, P_{i_3} \, a_1$ or not, we have a contradiction.*

We distinguish two cases.

Case 1: $a_1 \, P_{i_3} \, a_3$.

The given stable improvement cycle exists only if $a_3 \, P_{i_2} \, a_2$. Since i_1 has the top priority at a_1, either i_2 or i_3 has the top priority at a_3. But since $a_3 \, P_{i_2} \, a_2$ and i_3 gets a_3, i_3 has higher priority at a_3 than i_2. Thus, i_3 is the student with the top priority at a_3, which implies that i_2 has the top priority at a_2.

(1) Suppose that i_2 top-ranks a_3 and i_3 top-ranks a_1. (1.a) Assume that $i_3 \succ'_{a_3} i_1 \succ'_{a_3} i_2$. In order not to have a contradiction to $DA(R, \succ', q)$, we should have $R_{i_2} = a_3 a_1 a_2$, which implies $i_1 \succ'_{a_1} i_2 \succ'_{a_1} i_3$ and hence $R_{i_3} = a_1 a_3 a_2$. But in that case too, $DA_{i_1}(R, \succ', q) = a_2$, a contradiction. (1.b) Assume that $i_3 \succ'_{a_3} i_2 \succ'_{a_3} i_1$. Then $DA_{i_1}(R, \succ', q) = a_2$, a contradiction.

(2) Suppose that i_2 top-ranks a_3 and i_3 does not top-rank a_1. Then $R_{i_3} = a_2 a_1 a_3$. (2.a) Assume that $i_3 \succ'_{a_3} i_1 \succ'_{a_3} i_2$. If $R_{i_2} = a_3 a_1 a_2$, then $DA_{i_2}(R, \succ', q) = a_1$, a contradiction. If $R_{i_2} = a_3 a_2 a_1$, then $DA_{i_1}(R, \succ', q) = a_3$, a contradiction. (2.b) Assume that $i_3 \succ'_{a_3} i_2 \succ'_{a_3} i_1$. If $i_3 \succ'_{a_2} i_1$, then $DA_{i_3}(R, \succ', q) = a_2$, a contradiction. If $i_1 \succ'_{a_2} i_3$, then $DA_{i_1}(R, \succ', q) = a_2$, a contradiction.

(3) Suppose that i_2 does not top-rank a_3 and i_3 top-ranks a_1. Then $R_{i_2} = a_1 a_3 a_2$. (3.a) Assume that $i_1 \succ'_{a_1} i_2 \succ'_{a_1} i_3$. If $R_{i_3} = a_1 a_2 a_3$, then $DA_{i_3}(R, \succ', q) = a_2$, a contradiction. If $R_{i_3} = a_1 a_3 a_2$, then $DA_{i_1}(R, \succ', q) = a_2$, a contradiction. (3.b) Assume that $i_1 \succ'_{a_1} i_3 \succ'_{a_1} i_2$. If $i_1 \succ'_{a_3} i_2$, then $DA_{i_1}(R, \succ', q) = a_3$, a contradiction. If $i_2 \succ'_{a_3} i_1$, then $DA_{i_2}(R, \succ', q) = a_3$, a contradiction.

(4) Suppose that i_2 does not top-rank a_3 and i_3 does not top-rank a_1. Then $R_{i_2} = a_1 a_3 a_2$ and $R_{i_3} = a_2 a_1 a_3$, so that $DA_{i_1}(R, \succ', q) = a_3$, a contradiction.

Case 2: $a_3 \, P_{i_3} \, a_1$.

The given stable improvement cycle exists only if $R_{i_3} = a_2 a_3 a_1$ and $a_1 \, P_{i_2} \, a_2$. If i_2 does not top-rank a_3, then the three students have distinct first choices, a contradiction. Thus, $R_{i_2} = a_3 a_1 a_2$. If $i_1 \succ'_{a_3} i_2$, then $DA_{i_1}(R, \succ', q) = a_3$, a contradiction. Thus, assume, henceforth, that $i_2 \succ'_{a_3} i_1$. If $i_3 \succ_{a_2} i_1$, then $DA_{i_3}(R, \succ', q) = a_2$, a contradiction. If $i_1 \succ_{a_2} i_3$, then $DA_{i_1}(R, \succ', q) = a_2$, a contradiction. $\square$

Next, we show that at most one stable improvement cycle exists.

Lemma 2. *For each $R \in \mathcal{R}^N$ and each tie-breaker $\succ'$ of $\succsim$, $DA(R, \succ', q)$ admits at most one stable improvement cycle (which involves two students).*

Proof. Let $R \in \mathcal{R}^N$. Let $\succ'$ be a tie-breaker of $\succsim$. Suppose, by contradiction, that $DA(R, \succ', q)$ admits two stable improvement cycles. By Lemma 1, each cycle involves two students. Let i_1 be the student involved in both cycles. Denote the other two students by i_2 and i_3. For each $k \in \{1, 2, 3\}$, let $a_{i_k} \equiv DA_{i_k}(R, \succ', q)$ be the school assigned to student i_k. Since i_1 prefers a_{i_2} and a_{i_3} to a_{i_1}, R_{i_1} ranks a_{i_1} third. We may assume, without loss of generality, that $R_{i_1} = a_{i_2}a_{i_3}a_{i_1}$. Further, since i_1 was rejected by a_{i_2} and a_{i_3}, he does not have the top priority at a_{i_2} or a_{i_3}, which means that he has the top priority at a_{i_1}.

Since there is no cycle involving three students, each of i_2 and i_3 is assigned his second choice. Also, the fact that i_2 is involved in a cycle with i_1 implies $R_{i_2} = a_{i_1}a_{i_2}a_{i_3}$. Similarly, the fact that i_3 is involved in a cycle with i_1 implies $R_{i_3} = a_{i_1}a_{i_3}a_{i_2}$. If $i_2 \succ'_{a_{i_1}} i_3$, then $DA_{i_2}(R, \succ', q) = a_{i_1}$, a contradiction. If $i_3 \succ'_{a_{i_1}} i_2$, then $DA_{i_3}(R, \succ', q) = a_{i_1}$, a contradiction. $\square$

With the aid of the previous lemmas, we can now prove the claim.

Lemma 3. *Let $R \in \mathcal{R}^N$. Then $DA(R, \succsim, q)$ admits a stable improvement cycle with a positive probability if and only if R is symmetric to one of the three profiles in Section 1.*

Proof. The "if" part is trivial. To prove the "only if" part, let $R \in \mathcal{R}^N$ be such that $DA(R, \succsim, q)$ admits a stable improvement cycle with a positive probability. Then for some tie-breaker $\succ'$ of $\succsim$, $DA(R, \succ', q)$ admits a stable improvement cycle. By Lemmas 1 and 2, the cycle is unique and involves exactly two students; call them i and j and let $a_i \equiv DA_i(R, \succ', q)$ and $a_j \equiv DA_j(R, \succ', q)$ be the schools they are assigned. Then $h \in N \backslash \{i, j\}$ is the remaining student and $a_h \in A \backslash \{a_i, a_j\}$ is the remaining school. In sum, for assignment $\mu^* \equiv DA(R, \succ', q) = \begin{pmatrix} i & j & h \\ a_i & a_j & a_h \end{pmatrix}$, a unique stable improvement cycle exists involving i and j.

Since i desires a_j and j desires a_i, $a_j \, P_i \, a_i$ and $a_i \, P_j \, a_j$. This means that j does not have the top priority at a_i and that i does not have the top priority at a_j. Below we distinguish three cases, which depend on who have the top priorities at a_i and a_j, respectively (recall that each student has the top priority at exactly one school).

Case 1: $i \succ_{a_i} j \sim_{a_i} h$ and $j \succ_{a_j} i \sim_{a_j} h$.
Then the school priorities are:

$\succsim_{a_i}$	$\succsim_{a_j}$	$\succsim_{a_h}$
i	j	h
j, h	i, h	i, j

Since $a_j \, P_i \, a_i$, in the DA algorithm determining $DA(R, \succsim, q)$, i applies to a_j before applying to a_i. Similarly, j applies to a_i before applying to a_j. At least one of i and j should be displaced by h from their respective preferred school (i.e., a_j and a_i, respectively).[3] Without loss of generality, assume that i is displaced from a_j by h. Since in μ^*, h is eventually assigned to a_h where he has the top priority, μ^* can arise with a positive probability only

[3]Suppose not. Then i is displaced from a_j by j, which is possible only if j is displaced from a_i by i in some earlier step. This is impossible because then i applies to a_i before applying to a_j.

if $a_j \, P_h \, a_h$. Thus, $R_h \in \{a_j a_h a_i, a_j a_i a_h, a_i a_j a_h\}$. Now to find R that admits μ^* with a positive probability, we distinguish eight cases depending on $R_i \in \{a_h a_j a_i, a_j a_h a_i, a_j a_i a_h\}$ and $R_j \in \{a_h a_i a_j, a_i a_h a_j, a_i a_j a_h\}$.

Case 1.1: $R_i = a_h a_j a_i$ and $R_j = a_h a_i a_j$.

Assume that $i \sim_{a_h} j$ is broken in favor of i. Regardless of whether $R_h \in \{a_j a_h a_i, a_j a_i a_h\}$ or $R_h = a_i a_j a_h$, i gets a_h and μ^* does not obtain, a contradiction. Next, assume that $i \sim_{a_h} j$ is broken in favor of j. Then $R_h \notin \{a_j a_i a_h, a_i a_j a_h\}$, so that $R_h = a_j a_h a_i$. Moreover, $i \sim_{a_j} h$ should be broken in favor of i. But then j is assigned to a_i, a contradiction.

Case 1.2: $R_i = a_h a_j a_i$ and $R_j = a_i a_h a_j$.

Then R_h should not top-rank a_j. Thus, $R_h = a_i a_j a_h$. If $j \sim_{a_i} h$ is broken in favor of j, then j is assigned to a_i and μ^* does not obtain, a contradiction. Next, if $j \sim_{a_i} h$ is broken in favor of h, then regardless of how $i \sim_{a_h} j$ is broken, h gets a_i and μ^* does not obtain, a contradiction.

Case 1.3: $R_i = a_h a_j a_i$ and $R_j = a_i a_j a_h$.

Then R_h should not top-rank a_j. Thus, $R_h = a_i a_j a_h$. Then regardless of how $j \sim_{a_i} h$ is broken, i gets a_h and μ^* never obtains, a contradiction.

Case 1.4: $R_i = a_j a_h a_i$ and $R_j = a_h a_i a_j$.

Then R_h should not top-rank a_i. Thus, $R_h \in \{a_j a_h a_i, a_j a_i a_h\}$. Because i is displaced from a_j by h, $i \sim_{a_j} h$ should be broken in favor of h. But then regardless of how $i \sim_{a_h} j$ is broken, h gets a_j and μ^* never obtains, a contradiction.

Case 1.5: $R_i = a_j a_h a_i$ and $R_j \in \{a_i a_h a_j, a_i a_j a_h\}$.

Assume that R_h top-ranks a_j. Because i is displaced from a_j by h, $i \sim_{a_j} h$ should be broken in favor of h. Then i gets a_h and μ^* does not obtain, a contradiction. Next, assume that $R_h = a_i a_j a_h$. Regardless of how $j \sim_{a_i} h$ is broken, μ^* never obtains, a contradiction.

Case 1.6: $R_i = a_j a_i a_h$ and $R_j = a_h a_i a_j$.

Clearly, R_h should not top-rank a_i. Because i is displaced from a_j by h, $i \sim_{a_j} h$ should be broken in favor of h. But then h gets a_j and μ^* never obtains, a contradiction.

Case 1.7: $R_i = a_j a_i a_h$ and $R_j = a_i a_h a_j$.

Assume that R_h top-ranks a_j. Because i is displaced from a_j by h, $i \sim_{a_j} h$ should be broken in favor of h. Then j gets a_h and μ^* never obtains, a contradiction.

Assume that $R_h = a_i a_j a_h$. If $j \sim_{a_i} h$ is broken in favor of j, then regardless of how $i \sim_{a_j} h$ is broken, μ^* does not obtain. If $j \sim_{a_i} h$ is broken in favor of h, j gets a_j and μ^* does not obtain. In either case, we have a contradiction.

Case 1.8: $R_i = a_j a_i a_h$ and $R_j = a_i a_j a_h$.

If $R_h = a_j a_h a_i$, then we have Profile 1 (take $(i, j, h) = (3, 2, 1)$ and $(a_i, a_j, a_h) = (c, b, a)$). If $R_h = a_j a_i a_h$, then we have Profile 3 (take $(i, j, h) = (2, 3, 1)$ and $(a_i, a_j, a_h) = (b, c, a)$).

Finally, if $R_h = a_i a_j a_h$, then we have Profile 3 (take $(i,j,h) = (3,2,1)$ and $(a_i, a_j, a_h) = (c, b, a)$).

Case 2: $h \succ_{a_i} i \sim_{a_i} j$ and $j \succ_{a_j} i \sim_{a_j} h$.
Then the school priorities are:

$$\begin{array}{ccc} \succsim_{a_i} & \succsim_{a_j} & \succsim_{a_h} \\ \hline h & j & i \\ i,j & i,h & j,h \end{array}$$

First, we show that $R_h = a_j a_h a_i$. Note that $a_h \, P_h \, a_i$ because otherwise, h desires a_i and has a higher priority at a_i than j, contradicting that i and j constitute a stable improvement cycle. It remains to show that R_h does not top-rank a_h. To see this, suppose, by contradiction, that it does. Then $R_h \in \{a_h a_i a_j, a_h a_j a_i\}$. Now $a_i \, P_i \, a_h$ because otherwise, i applies to a_h before applying to a_i and he gets a_h for sure, a contradiction. Thus, $R_i = a_j a_i a_h$. Also, R_j does not top-rank a_i because otherwise, the three students have distinct top choices, a contradiction. Thus, $R_j = a_h a_i a_j$. If $R_h = a_h a_i a_j$, then μ^* never obtains. If $R_h = a_h a_j a_i$, (i) when $j \sim_{a_h} h$ is broken in favor of j, j gets a_h; and (ii) when $j \sim_{a_h} h$ is broken in favor of h, j gets a_i. Thus, regardless of $R_h = a_h a_i a_j$ or $R_h = a_h a_j a_i$, μ^* never obtains, a contradiction.

Now we distinguish six cases depending on $R_i \in \{a_h a_j a_i, a_j a_h a_i, a_j a_i a_h\}$ and $R_j \in \{a_h a_i a_j, a_i a_h a_j, a_i a_j a_h\}$.

Case 2.1: $R_i = a_h a_j a_i$.

Then i gets h for sure, a contradiction.

Case 2.2: $R_i = a_j a_h a_i$ and $R_j = a_h a_i a_j$.

If $i \sim_{a_j} h$ is broken in favor of i, i gets a_j. Otherwise, i gets a_h. Thus, μ^* never obtains, a contradiction.

Case 2.3: $R_i = a_j a_h a_i$ and $R_j \in \{a_i a_h a_j, a_i a_j a_h\}$.

Regardless of how $i \sim_{a_j} h$ is broken, j gets a_i for sure, a contradiction.

Case 2.4: $R_i = a_j a_i a_h$ and $R_j = a_h a_i a_j$.

If $i \sim_{a_j} h$ is broken in favor of i, then (regardless of how $j \sim_{a_h} h$ is broken) i gets a_j for sure. Otherwise, j gets a_h. Thus, μ^* never obtains, a contradiction.

Case 2.5: $R_i = a_j a_i a_h$ and $R_j = a_i a_h a_j$.

If $i \sim_{a_j} h$ is broken in favor of i, i gets a_j. Otherwise, (regardless of how $i \sim_{a_i} j$ is broken) h gets a_j for sure. Thus, μ^* never obtains, a contradiction.

Case 2.6: $R_i = a_j a_i a_h$ and $R_j = a_i a_j a_h$.

This case is Profile 2 (take $(i,j,h) = (1,3,2)$ and $(a_i, a_j, a_h) = (b, c, a)$).

Case 3: $i \succ_{a_i} j \sim_{a_i} h$ and $h \succ_{a_j} i \sim_{a_j} j$.

This case is symmetric to Case 2. Only the preference profile symmetric to Profile 2 is possible. □

3. Analysis of Profile 3

In this section, we provide theoretical results on Profile 3. Denote Profile 3 by R^{***}. The DA game can be analyzed as in Section 3 of our paper and truth-telling is a unique Nash equilibrium in undominated strategies.

Proposition 1. *Let u be a utility profile consistent with R^{***}. The DA game $(u, \succsim, q, \mathcal{R}, DA)$ has a unique Nash equilibrium in undominated strategies, which is truth-telling and yields* $\frac{3}{4}\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix} + \frac{1}{4}\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$ *as an assignment.*

Note that $\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix}$ is inefficient for Profile 3. Thus, DA produces an inefficient assignment with probability $\frac{3}{4}$, which is the highest among the corresponding probabilities for Profiles 1–3.

Next, we turn attention to the CADA game. The analysis is similar to that in Proposition 2 of our paper, except that student 1 can target any one of two schools in an undominated Nash equilibrium. Yet the resulting matching outcome is unique.

Proposition 2. *Let u be a utility profile consistent with R^{***}. The CADA game $(u, \succsim, q, \mathcal{R} \times A, CADA)$ has two Nash equilibria in undominated strategies, where each student reports his preferences truthfully, student 1 targets c or b, and students 2 and 3 target their respective top schools. Both equilibria yield* $\frac{1}{2}\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix} + \frac{1}{2}\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$ *as an assignment.*

Proof. Since targeting only affects how ties in priorities are broken in DA, reporting true preferences is still part of a weakly dominant strategy in the CADA game. Concerning targeting, let $t \equiv (t_1, t_2, t_3)$ be a targeting profile. Clearly, $t_2 = c$ and $t_3 = b$ are uniquely undominated for students 2 and 3, respectively. For student 1, undominatedness requires $t_1 \in \{b, c\}$. When students report Profile 2 and choose $t \in \{(b, c, b), (c, c, b)\}$, $CADA(R, t, \succsim, q) = \frac{1}{2}\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix} + \frac{1}{2}\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$. Thus, each Nash equilibrium in undominated strategies involves truthful preference reporting and one of (b, c, b) and (c, c, b) as target schools. □

The above CADA outcome achieves a Pareto improvement upon the DA outcome. However, it chooses an inefficient assignment $\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix}$ with probability $\frac{1}{2}$, which is still substantially high. The CADA game has a Nash equilibrium that produces an efficient matching for sure but it can arise only if student 1's targeting choice is dominated, as was the case for Profile 1. Our next proposition makes this point.

Proposition 3. *Let u be a utility profile consistent with R^{***} and consider the CADA game $(u, \succsim, q, \mathcal{R} \times A, CADA)$. In each Nash equilibrium with truthful preference reporting, the associated targeting profile is (t_1, c, b), where $t_1 \in \{a, b, c\}$. Thus, the resulting equilibrium assignment is* $\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$ *if $t_1 = a$ and* $\frac{1}{2}\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix} + \frac{1}{2}\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$ *if $t_1 \in \{b, c\}$.*

Proof. Consider a strategy profile in which students' preferences are truthful. Targeting choices affect only how the relevant ties, $1 \sim_c 2$ and $1 \sim_b 3$, are broken. With true preferences reported, each case of tie-breaking yields the following assignments: $\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix}$ if $1 \succ_c 2$ or $[2 \succ_c 1$ and $1 \succ_b 3]$; and $\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$ if $2 \succ_c 1$ and $3 \succ_b 1$. This can be used to find each student's best response in targeting.

For each $i \in N$, let t_i be student i's targeting choice and $BR_i : A^2 \to A$ be i's best response in targeting. First, for student 1, for each $(t_2, t_3) \in A^2$, $BR_1(t_2, t_3) = \{a, b, c\}$. This is because in the two assignments, $\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix}$ and $\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$, student 1 always gets school a, so that all targeting choices are indifferent to him. Next, student 2's best response in targeting is given by the following table (each cell contains the value of $BR_2(t_1, t_3)$).

		t_3: a	b	c
	a	$\{c\}$	$\{c\}$	$\{c\}$
t_1	b	$\{a, b, c\}$	$\{c\}$	$\{a, b, c\}$
	c	$\{c\}$	$\{c\}$	$\{c\}$

Also, student 3's best response in targeting is given by the following table.

		t_2: a	b	c
	a	$\{b\}$	$\{b\}$	$\{b\}$
t_1	b	$\{b\}$	$\{b\}$	$\{b\}$
	c	$\{a, b, c\}$	$\{a, b, c\}$	$\{b\}$

With these best responses, it is simple to see that (combined with true preferences) only three targeting profiles, $\{(t_1, c, b) : t_1 \in \{a, b, c\}\}$, constitute equilibria. $\square$

Next is the SIC game. As was the case for Profiles 1 and 2, the SIC game has a unique equilibrium matching outcome. It produces an efficient assignment with probability 1 and is also a Pareto improvement upon the CADA outcome (and hence upon the DA outcome).

Proposition 4. *Let u be a utility profile consistent with R^{***}. For the SIC game $(u, \succsim, q, \mathcal{R}, SIC)$, the unique matching outcome of the Nash equilibria in undominated strategies is* $\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$.

Proof. First, we show that for student 2, cba weakly dominates bac, bca, and abc. Since student 2 has the top priority at school b, reporting bac or bca gives him school b for sure. Also, submitting abc leads to a mixture of schools a and b. By contrast, cba yields a mixture of schools c and b and sometimes c for sure if student 2's opponents play appropriately. Therefore, cba weakly dominates bac, bca, and abc.

Similarly, we can show that (i) for student 1, cba weakly dominates abc and acb; and (ii) for student 3, bca weakly dominates cab, cba, and acb. Thus, with weakly dominated strategies eliminated, the remaining strategies are $\{bac, bca, cab, cba\}$ for student 1, $\{acb, cab, cba\}$ for student 2, and $\{abc, bac, bca\}$ for student 3.

Let $s \equiv (s_1, s_2, s_3)$ be an undominated Nash equilibrium. Then $s_1 \in \{bac, bca, cab, cba\}$, $s_2 \in \{acb, cab, cba\}$, and $s_3 \in \{abc, bac, bca\}$. When students' choices are confined to these strategies, one can use an oTree simulation to obtain SIC assignments (the SIC game is reduced toa $4 \times 3 \times 3$ game now). If $s_3 = abc$, then the assignments are:

		s_2		
		acb	cab	cba
s_1	bac	$\frac{1}{4}(b,a,c) + \frac{3}{4}(b,c,a)$	(b,c,a)	(b,c,a)
	bca	$\frac{1}{4}(b,a,c) + \frac{1}{2}(b,c,a) + \frac{1}{4}(c,a,b)$	(b,c,a)	(b,c,a)
	cab	$\frac{3}{4}(c,a,b) + \frac{1}{4}(c,b,a)$	$\frac{1}{2}(a,c,b) + \frac{1}{4}(c,a,b) + \frac{1}{4}(c,b,a)$	$\frac{1}{2}(a,c,b) + \frac{1}{2}(c,b,a)$
	cba	$\frac{1}{4}(b,c,a) + \frac{1}{2}(c,a,b) + \frac{1}{4}(c,b,a)$	$\frac{1}{2}(b,c,a) + \frac{1}{4}(c,a,b) + \frac{1}{4}(c,b,a)$	$\frac{1}{2}(b,c,a) + \frac{1}{2}(c,b,a)$

If $s_3 = bac$, then the assignments are:

		s_2		
		acb	cab	cba
s_1	bac	$\frac{1}{2}(a,c,b) + \frac{1}{4}(b,a,c) + \frac{1}{4}(b,c,a)$	$\frac{1}{2}(a,c,b) + \frac{1}{2}(b,c,a)$	$\frac{1}{2}(a,c,b) + \frac{1}{2}(b,c,a)$
	bca	$\frac{1}{4}(b,a,c) + \frac{1}{4}(b,c,a) + \frac{1}{2}(c,a,b)$	$\frac{1}{4}(a,c,b) + \frac{1}{2}(b,c,a) + \frac{1}{4}(c,a,b)$	$\frac{1}{4}(a,c,b) + \frac{3}{4}(b,c,a)$
	cab	(c,a,b)	$\frac{1}{2}(a,c,b) + \frac{1}{2}(c,a,b)$	$\frac{1}{2}(a,c,b) + \frac{1}{2}(c,b,a)$
	cba	(c,a,b)	$\frac{1}{4}(a,c,b) + \frac{1}{4}(b,c,a) + \frac{1}{2}(c,a,b)$	$\frac{1}{4}(a,c,b) + \frac{1}{4}(b,c,a) + \frac{1}{2}(c,b,a)$

Finally, if $s_3 = bca$, then the assignments are:

		s_2		
		acb	cab	cba
	bac	$\frac{1}{2}(a,c,b)+\frac{1}{2}(b,a,c)$	$\frac{1}{2}(a,c,b)+\frac{1}{2}(b,a,c)$	(a,c,b)
s_1	bca	$\frac{1}{2}(b,a,c)+\frac{1}{2}(c,a,b)$	$\frac{1}{4}(a,c,b)+\frac{1}{2}(b,a,c)+\frac{1}{4}(c,a,b)$	(a,c,b)
	cab	(c,a,b)	$\frac{1}{2}(a,c,b)+\frac{1}{2}(c,a,b)$	(a,c,b)
	cba	(c,a,b)	$\frac{1}{4}(a,c,b)+\frac{3}{4}(c,a,b)$	(a,c,b)

Of the strategy profiles considered in the above three tables, only those in $\{(s_1', cba, bca) : s_1' \in \{bac, bca, cab, cba\}\}$ are Nash equilibria (as long as the utility profile u is consistent with R^{***}). Since s belongs to the latter set and since the strategy profiles in the set all produce the same assignment $\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$, so does s. □

To summarize equilibrium outcomes from the three revelation games, the DA matching outcome is $\frac{3}{4}\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix} + \frac{1}{4}\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$, which involves an inefficient assignment $\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix}$. The CADA game yields a Pareto-improved yet still inefficient assignment $\frac{1}{2}\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix} + \frac{1}{2}\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$ in undominated Nash equilibria. SIC produces a further-Pareto-improved, efficient assignment $\begin{pmatrix} 1 & 2 & 3 \\ a & c & b \end{pmatrix}$. CADA can do the same if student 1 plays a weakly dominated strategy. Student 1 has the highest priority at school a, which is unanimously bottom-ranked, and in all these equilibrium matchings, he gets school a for sure.

4. Additional Figures and Tables

4.1. Lab Date Only. We conducted 4 sessions (72 subjects for 2 DA-B, 1 CADA-B, and 1 SIC-B sessions) via the face-to-face laboratory mode with z-Tree in November, 2019. In this section, we present the same set of figures using the data from the lab only.

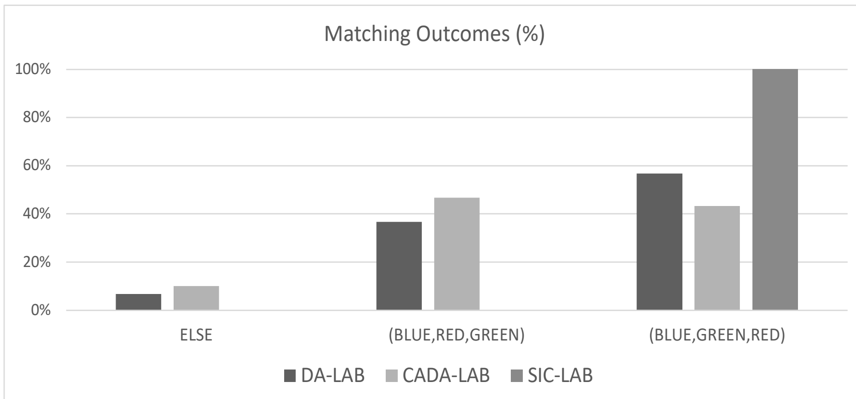


Figure 1. Matching Outcome

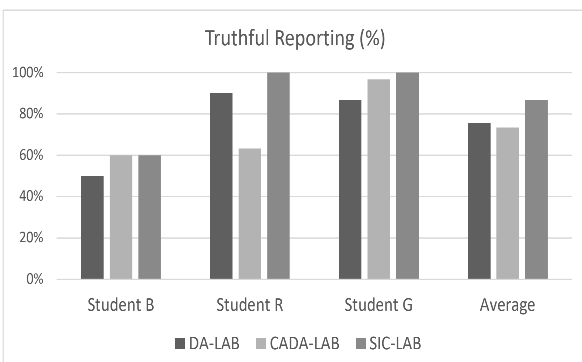


Figure 2. Truthful Reporting

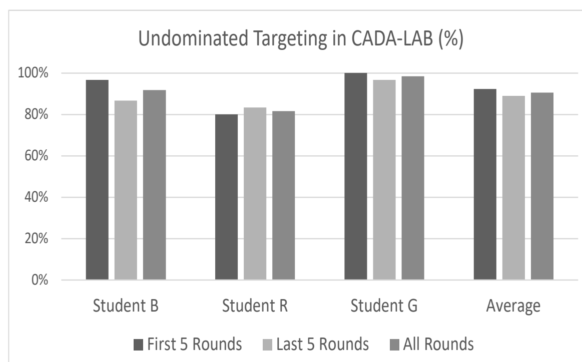


Figure 3. Targeting in CADA

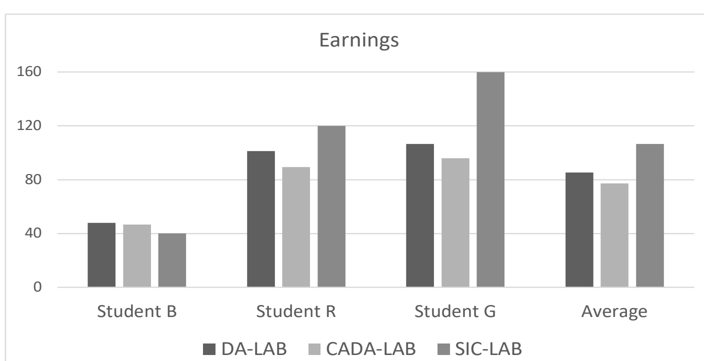


Figure 4. Earnings

4.2. Time Trend Data for Baseline Environment. This section reports time-trend graphs for the baseline environment.

Matching Outcomes

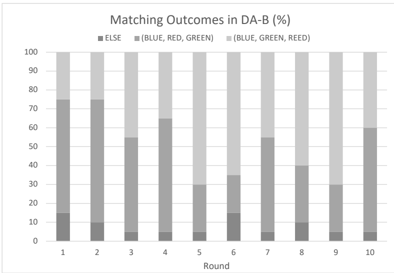


Figure 5. DA-B

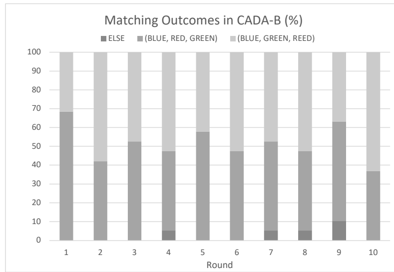


Figure 6. CADA-B

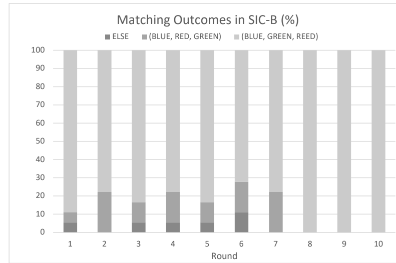


Figure 7. SIC-B

Earnings

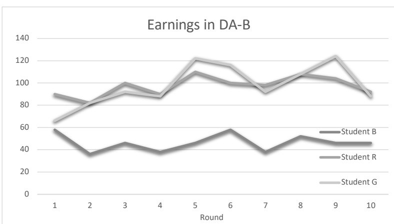


Figure 8. DA-B

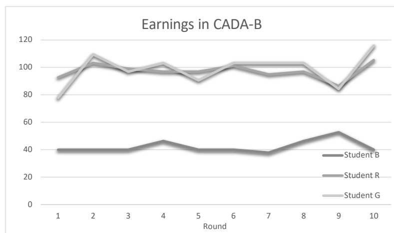


Figure 9. CADA-B

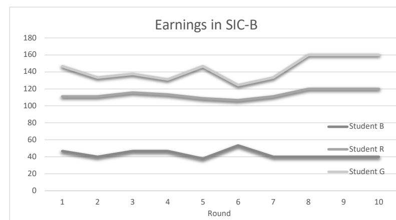


Figure 10. SIC-B

Truthful Reporting

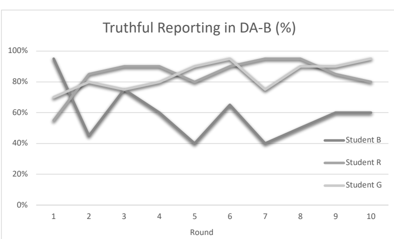


Figure 11. DA-B

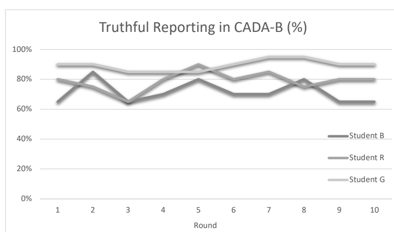


Figure 12. CADA-B

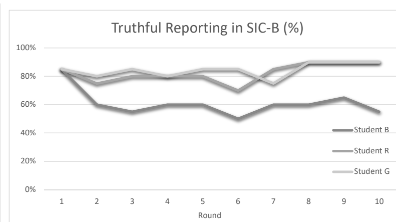


Figure 13. SIC-B

Targeting in CADA

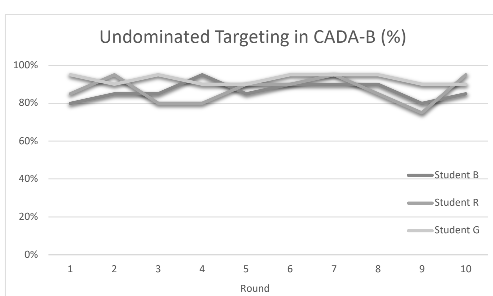


Figure 14. CADA-B

4.3. Time Trend Data for Replica Environment. This section reports time-trend graphs for the replica environment.

Matching Outcomes

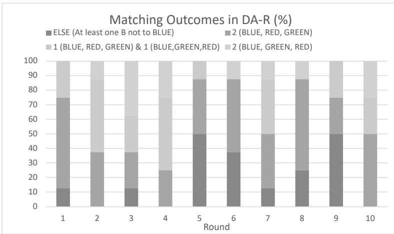


FIGURE 15. DA-R

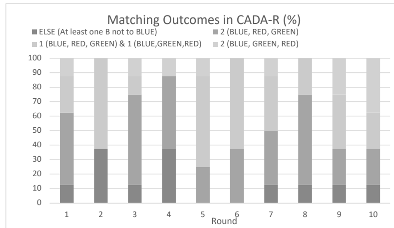


FIGURE 16. CADA-R

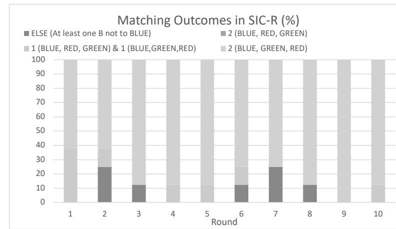


FIGURE 17. SIC-R

Earnings

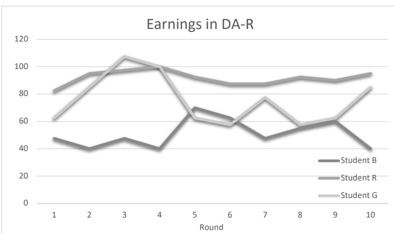


FIGURE 18. DA-R

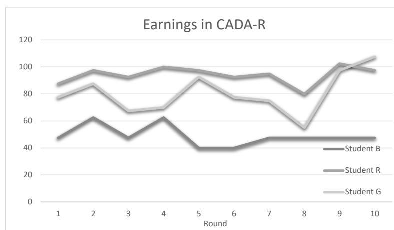


FIGURE 19. CADA-R

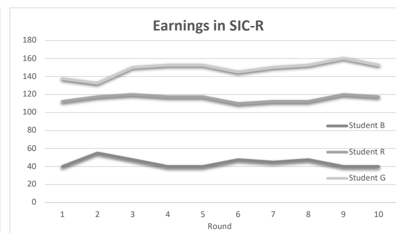


FIGURE 20. SIC-R

Truthful Reporting

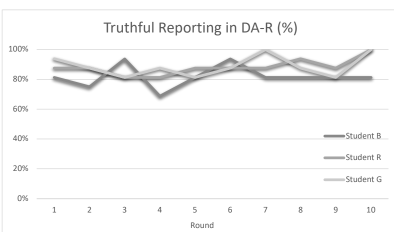


FIGURE 21. DA-R

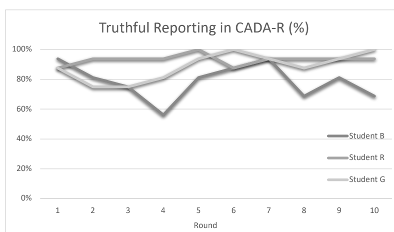


FIGURE 22. CADA-R

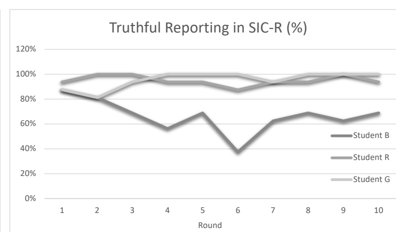


FIGURE 23. SIC-R

Targeting in CADA

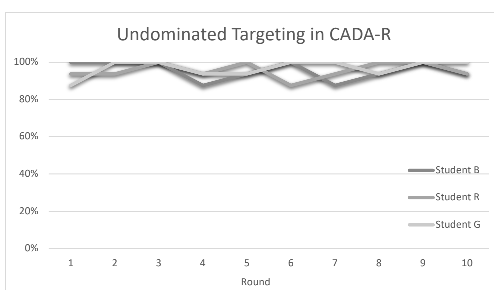


FIGURE 24. CADA-R

4.4. Time Trend Data for Cardinal Environment. This section reports time-trend graphs for the cardinal environment.

Matching Outcomes

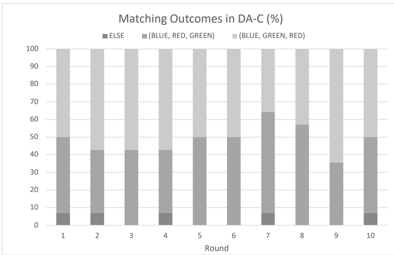


FIGURE 25. DA-C

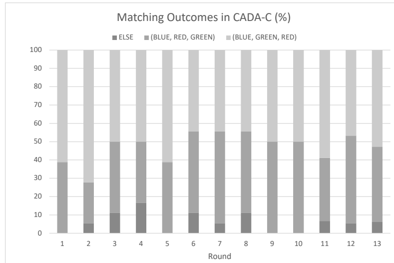


FIGURE 26. CADA-C

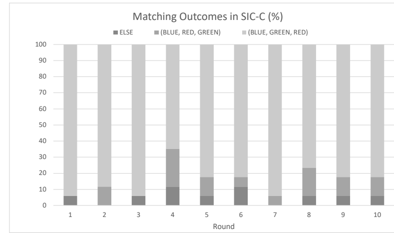


FIGURE 27. SIC-C

Earnings

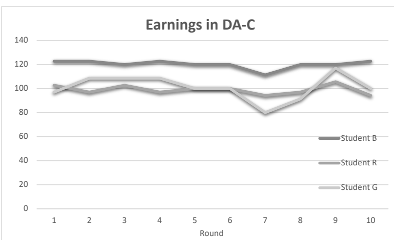


FIGURE 28. DA-C

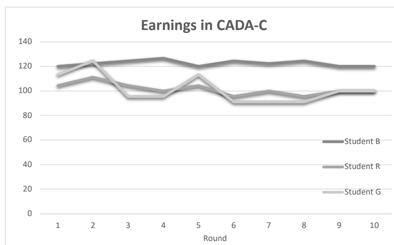


FIGURE 29. CADA-C

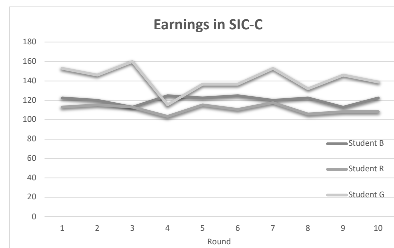


FIGURE 30. SIC-C

Truthful Reporting

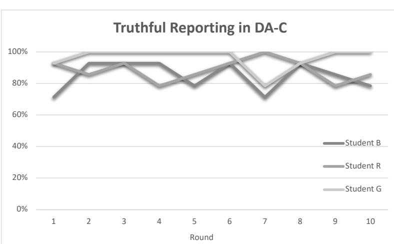


FIGURE 31. DA-C

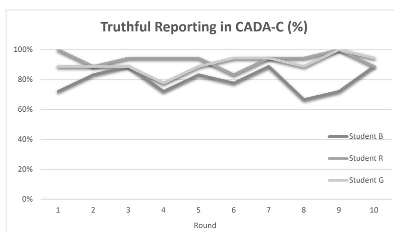


FIGURE 32. CADA-C

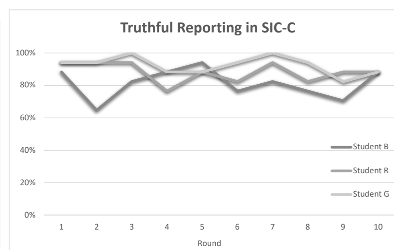


FIGURE 33. SIC-C

Targeting in CADA

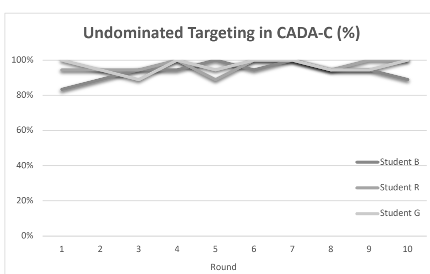


FIGURE 34. CADA-C

4.5. Time Trend Data for New Environment. This section reports time-trend graphs for the new environment.

Matching Outcomes

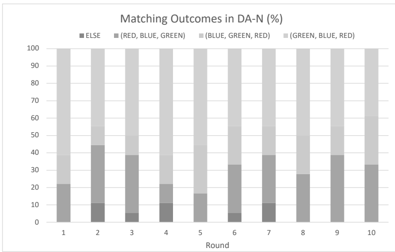


FIGURE 35. DA-N

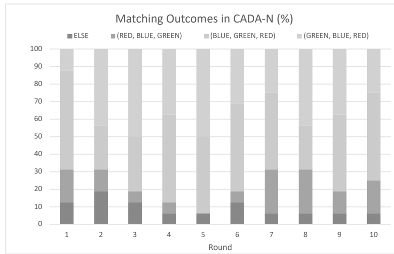


FIGURE 36. CADA-N

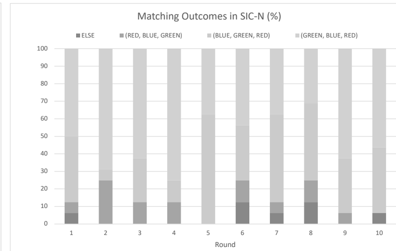


FIGURE 37. SIC-N

Earnings

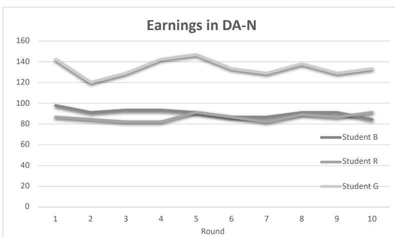


FIGURE 38. DA-N

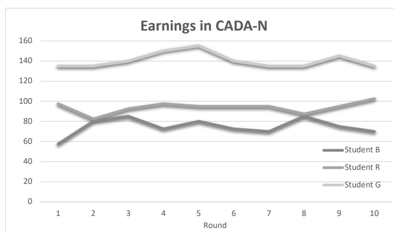


FIGURE 39. CADA-N

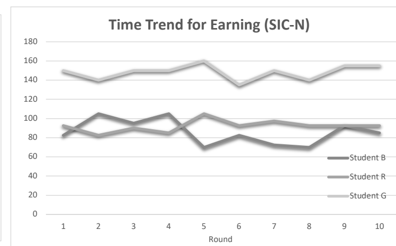


FIGURE 40. SIC-N

Truthful Reporting

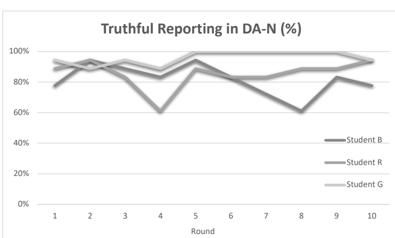


FIGURE 41. DA-N

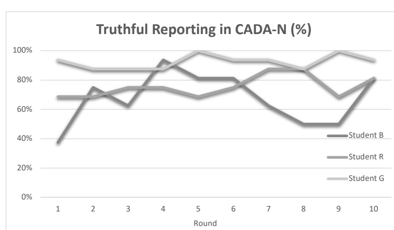


FIGURE 42. CADA-N

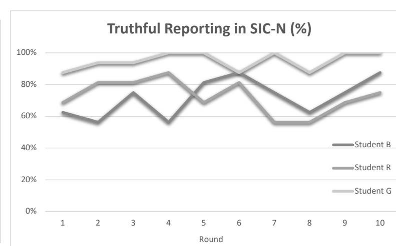


FIGURE 43. SIC-N

Targeting in CADA

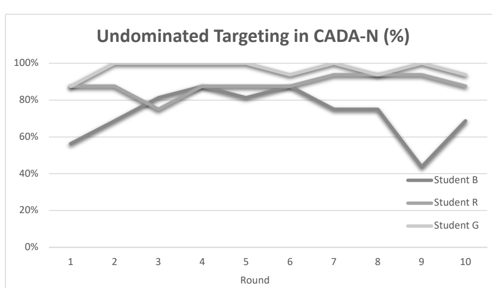


FIGURE 44. CADA-N

5. Experimental Instructions: Treatment DA-B

Welcome to this experiment. Please read these instructions carefully. This experiment studies the interaction of decisions made by three individuals. In the following one and a half hours or so, you will participate in 10 rounds of decision making. The payment you will receive from this experiment will depend on the decisions you make. The amount you earn will be paid **electronically via the HKUST Autopay System to the bank account you provide to the Student Information System (SIS)**. The auto-payment will be arranged by the Finance Office of HKUST, which takes about two weeks or more.

In each round, you will be randomly matched with two other participants to form a group of three. Your group will be formed randomly and independently in each round. You will not be told the identity of the participants you are matched with, nor will those participants be told your identity even after the end of the experiment.

Overview. The experiment is about three students who are trying to enter a school. The three participants in the same group represent students competing for school seats.

The three students live in an island whose map is presented in Figure 46 below. The island consists of three administrative districts – BLUE zone, RED zone, and GREEN zone. There is one student who lives in each zone. There are three schools in the island, one in the BLUE zone, one in the RED zone, and one in the GREEN zone. Each school has only one seat. For the rest of the instruction, we shall call the student and the school in **B**LUE / **R**ED / **G**REEN zone Student B / R / G and School BLUE / RED / GREEN.

In each round, the three participants in your group will be randomly assigned to the role of Student B / R / G. You will be informed about your role at the beginning of each round.

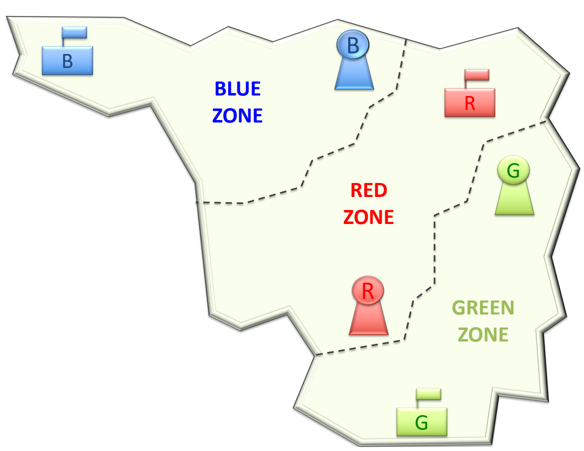


FIGURE 45. Island - BLUE / RED / GREEN ZONES

Your payoff depends on to which school you are admitted. In order to get an admission to any school, you have to participate in the centralized allocation mechanism described below.

Admission Process via Central Admission Office

At the beginning of each round, you will be informed whether you are Student B / R / G. You will then submit the list of your preference rankings to a central admission office. To make admission decisions, the admission office will use

a. the submitted preference rankings from all three students in your group, and
b. each school's priority information.

Each school gives a *priority* to the student who lives in the same district. For example, School BLUE gives a priority to Student B but treats Students R and G equally. The admission procedure is as follows:

(1) Each student's application is sent to the school of his/her top choice.
(2) If a school receives only one application, it tentatively keeps the student.
(3) If a school receives more than one application, then it determines which student to retain based on the **priority**. If a school receives an application from the student with priority, it chooses that student. Otherwise, it **randomly** chooses one non-priority student among those who applied to it.
(4) Whenever an application is rejected at a school, his/her application is sent to the next highest school on his/her submitted list.
(5) Whenever a school receives new applications, these applications are considered together with the retained application for that school. Among the retained and new applications, each school chooses one based on the priority.
(6) The allocation is finalized when no more applications can be rejected. Each student is **admitted** by the school that holds his/her application at the end of the process.

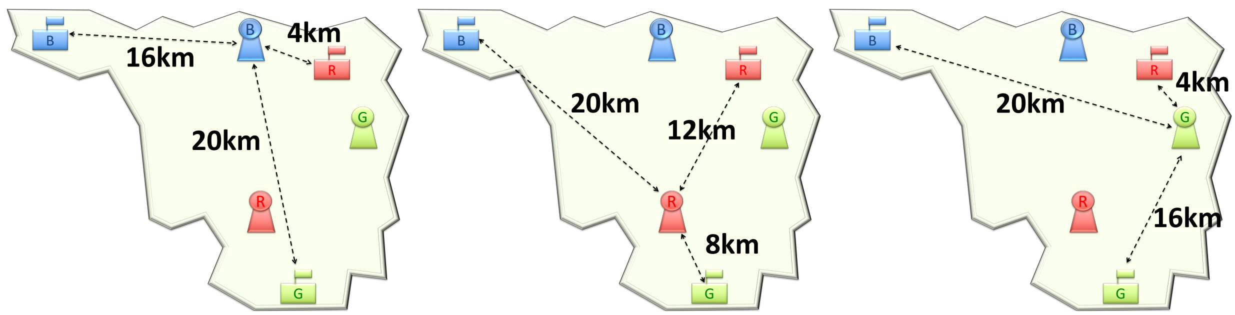
Note that the only thing each student needs to do is to submit his/her preference rankings. (If you do not submit your preference ranking within 2 minutes, a randomly generated preference ranking will be automatically submitted.) All the steps described above take place in the admission system automatically, without any further inputs from the students. The entire admission process (i.e., who applies to which school and who are tentatively accepted or rejected by each school) in each round will be presented to you via your computer screen in a transparent way.

Payoffs

Your payoff depends on the distance (km) between your location and the school you are admitted to. Your payoff will be higher if you are admitted by the school that is **closer** to your location. Precisely,

Your Payoff (in HKD) = 200 − 10 × [The distance (in km) between you and the school that admits you]

where the distance is presented as follows:



Student B | Student R | Student G

For example,

- Student B receives the payoff of $(200 - 160) = 40$ if he is admitted by School BLUE.
- Student R receives the payoff of $(200 - 80) = 120$ if she is admitted by School GREEN.
- Student G receives the payoff of $(200 - 40) = 160$ if he is admitted by School RED.

Information Feedback

After you and the two other subjects in your group submit their preference rankings, the submitted rankings will be revealed to everyone in your group. The admission process will be presented with full transparency such that you can see which school tentatively keeps or rejects your application. At the end of each round, the computer will provide you with some feedback, including 1) which school you are finally admitted to, 2) your payoff, 3) the submitted preference rankings from all students in your group, 4) which schools other students in your group are admitted to, and 5) their payoffs.

Your Payment

The computer will randomly select 1 round out of the 10 rounds to calculate your payment. So it is in your best interest to take each round equally seriously. Your total payment in HKD will be the payoff you earned in the selected round plus a HKD 40 show-up fee.

Example and Practice

To ensure your understanding of the instructions, we will provide you with an example through the computer screen. After the example, you will participate in a practice round. The practice round is part of the instructions and is not relevant to your payment. Its objective is to get you familiar with the computer interface and the flow of the decisions in each round. Once the practice round is over, the computer will tell you "The official rounds begin now!"

Completion of the Experiment

After the 10th round, the experiment will be over. You will be instructed to fill in the receipt for your payment. The amount you earn will be paid electronically via the HKUST Autopay System to the bank account you provide to the Student Information System (SIS). The auto-payment will be arranged by the Finance Office of HKUST.

6. Experimental Instructions: Treatment SIC-B

Welcome to this experiment. Please read these instructions carefully. This experiment studies the interaction of decisions made by three individuals. In the following one and a half hours or so, you will participate in 10 rounds of decision making. The payment you will receive from this experiment will depend on the decisions you make. The amount you earn will be paid **electronically via the HKUST Autopay System to the bank account you provide to the Student Information System (SIS)**. The auto-payment will be arranged by the Finance Office of HKUST, which takes about two weeks or more.

In each round, you will be randomly matched with two other participants to form a group of three. Your group will be formed randomly and independently in each round. You will not be told the identity of the participants you are matched with, nor will those participants be told your identity even after the end of the experiment.

Overview. The experiment is about three students who are trying to enter a school. The three participants in the same group represent students competing for school seats.

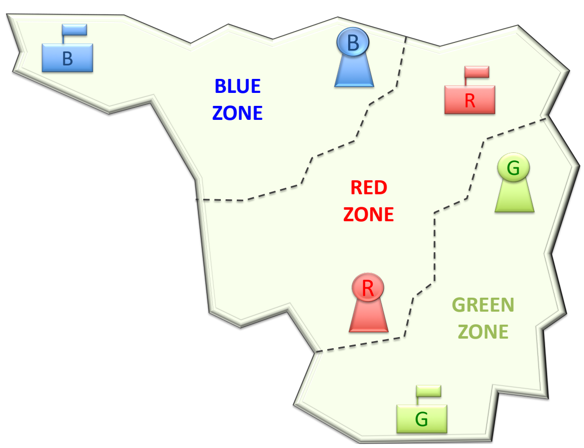


FIGURE 46. Island - BLUE / RED / GREEN ZONES

The three students live in an island whose map is presented in Figure 46 below. The island consists of three administrative districts – BLUE zone, RED zone, and GREEN zone. There is one student who lives in each zone. There are three schools in the island, one in the BLUE zone, one in the RED zone, and one in the GREEN zone. Each school has only one seat. For the rest of the instruction, we shall call the student and the school in **B**LUE / **R**ED / **G**REEN zone Student B / R / G and School BLUE / RED / GREEN.

In each round, the three participants in your group will be randomly assigned to the role of Student B / R / G. You will be informed about your role at the beginning of each round.

Your payoff depends on to which school you are admitted. In order to get an admission to any school, you have to participate in the centralized allocation mechanism described below.

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At the beginning of each round, you will be informed whether you are Student B / R / G. You will then submit the list of your preference rankings to a central admission office. To make admission decisions, the admission office will use

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(4) Whenever an application is rejected at a school, his/her application is sent to the next highest school on his/her submitted list.
(5) Whenever a school receives new applications, these applications are considered together with the retained application for that school. Among the retained and new applications, each school chooses one based on the priority.
(6) The allocation is temporarily finalized when no more applications can be rejected. Each student is **temporarily admitted** by the school that holds his/her application at the end of the process.
(7) The admission office will check if **swapping** your school assignment with another student's assignment can make both you and the other better off according to the submitted rankings. If the admission office finds one such case, then swapping will take place and the school assignment is finalized. Otherwise, the allocation is finalized without swapping.

Note that the only thing each student needs to do is to submit his/her preference rankings. (If you do not submit your preference ranking within 2 minutes, a randomly generated preference ranking will be automatically submitted.) All the steps described above take place in the admission system automatically, without any further inputs from the students. The entire admission process (i.e., who applies to which school, who are tentatively accepted or rejected by each school, and whose school assignments are swapped if any) in each round will be presented to you via your computer screen in a transparent way.

Payoffs

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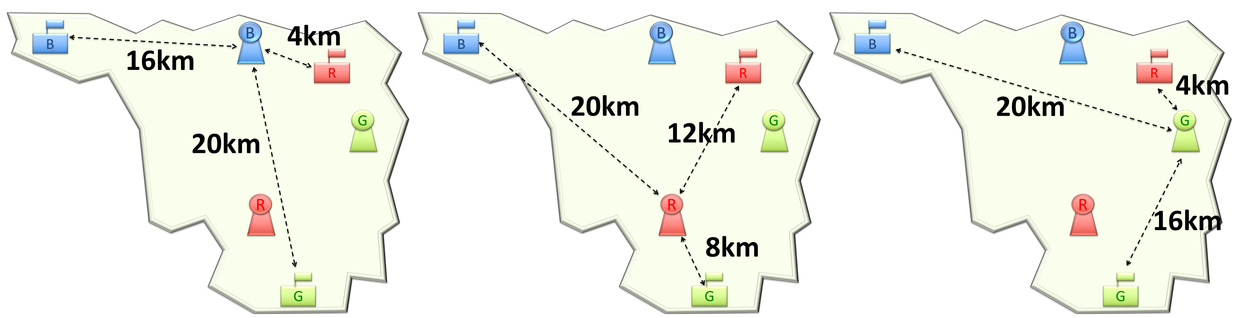
Your Payoff (in HKD) = 200 − 10 × [The distance (in km) between you and the school that admits you]

where the distance is presented as follows:



Student B Student R Student G

For example,

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Information Feedback

After you and the two other subjects in your group submit their preference rankings, the submitted rankings will be revealed to everyone in your group. The admission process will be presented with full transparency such that you can see which school tentatively keeps or rejects your application, and if any swapping of the school assignments takes place or not. At the end of each round, the computer will provide you with some feedback, including 1) which school you are finally admitted to, 2) your payoff, 3) the submitted preference rankings from all students in your group, 4) which schools other students in your group are admitted to, and 5) their payoffs.

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