I. Experimental Design

In the experiment, subjects made a decision modeled on the decision to register as an organ donor. In the experiment there is no difference between registering (in advance) to donate and being an available donor at death, and we will refer to this decision as “donating.” The instructions to subjects were stated in abstract terms, not in terms of organs. Subjects started each round with one “A unit” (which can be thought of as a brain) and two “B units” (representing kidneys). Each subject earned $1 in each period in which they had both an active A unit and at least one active B unit (representing a flow of utility from being alive and healthy). Each period, the subject’s A unit had a 10 percent probability of failing and the B units had a 20 percent chance of failing (both B units operated or failed together). Before making the donation decision in the first round, all subjects were informed that each round began with the subject having $2 and consisted of a number of periods in which they could earn more money. Whenever a subject’s A unit failed, he lost $1 and the round ended for him (representing brain death). When a subject’s B units failed, he had up to five periods to receive a B unit from someone else (representing dialysis, during which time he did not earn any money). If a subject did not receive a B unit in those five periods, he lost $1 and the round ended for him (again representing death). Subjects could receive a B unit from another player in a given period if that player’s A unit failed in that period while his B units were still active, if and only if the player had agreed to donate his B units at the start of that round. Subjects made a donation decision 31 times in a fixed group of 12 subjects. Subjects were not informed of the number of times they would make the decision but were told they would be paid for four randomly selected rounds. The donation decision was always asked at the start of the round, before any periods had passed, so subjects made the donation decision before knowing whether their A unit or B units would fail first. Subjects were randomly assigned at the beginning of the game to have either low or high costs of donation (each group of 12 subjects had 6 low-cost donors and 6 high-cost donors) and were only informed of their own cost of donation. Low-cost donors had to pay $0.40 so that their B units would be given to other subjects in the event that they had A unit failure (subjects who agreed to be donors always paid the cost, regardless of whether they had A unit failure or B unit failure first, representing the psychological costs of donation incurred at the time of the decision to register as a donor). High-cost donors had to pay $0.80 for their B units to be donated in the event of A unit failure. Subjects remained high- or low-cost donors for the entire experiment. All subjects were told that if they were a donor and their A unit failed first, each of their B units would be donated to a subject who had failed B units and was waiting for a B unit if such a subject were present in that period. They were also told that B units could not be donated again in the same round (i.e., a donated B unit could not be donated again after the failure of the recipient’s A unit). After making the donation decision, subjects watched their outcome for each period of that round and were able to observe if any of their units failed in that period, how many periods they were waiting for a B unit, whether they received a B unit in that period, and how much money they had earned so far in that round of the game. After a subject could not earn any more money in a round, he stopped receiving information each period and waited for the next round to begin. Subjects received no information about the donation decisions or earnings of other subjects, and subjects were not informed if B units they donated were actually provided to other subjects (i.e., they did not know whether a subject needed a B unit in the period in which their A unit failed). There were four different conditions under which subjects made donation decisions in the experiment. In the control condition, subjects were informed that donated B units were provided to those who needed B units in the order that those subjects had been waiting for B units: so subjects who had been waiting five periods would receive an available B unit before a subject who had been waiting four periods and so on.

In the priority condition (motivated by the donor priority rules in Singapore and Israel), subjects were informed that those who agreed to be donors at the start of the round would be given priority should they need to receive a B unit, and that B units would be provided first to subjects who had agreed to be donors, and only if no donors were in need of B units would B units be provided to subjects who were not donors. Within each priority group, B units were assigned by the length of time subjects had been waiting for B units, with those who were waiting the longest getting available B units first. The priority condition generated an incentive for donating, the value of which depended on the number of other subjects who registered as donors. As long at least one other member of the group donated, donors were more likely than nondonors to receive a B unit if they needed one. In addition, in the priority condition, registering as a donor provided a relatively strong positive externality to other donors since they were more likely than nondonors to receive donated B units. In the discount condition, B units were assigned as in the control condition, but all subject costs were $0.35 lower than in the control condition, so low-cost donors paid $0.05 to donate their B units and high-cost donors paid $0.45 to donate their B units. The $0.35 discount approximates the expected value of the incentive for donation achieved by the priority rule (and the amount paid to donors in the rebate condition, described next) if five to six donors are contributing in a round.16 This treatment was run to investigate whether the behavior change due to the priority rule could be replicated by a discount alone, simply offsetting the costs of donation and not generating the positive externalities to other donors. In the rebate condition, B units were assigned as in the control condition, but subjects were informed that those who paid to be a donor would receive a rebate at the end of the experiment based on the number of other subjects in their group who also agreed to be donors. (Rebates were reported only at the end of the experiment to avoid giving subjects direct information about the number of donors or how that number was changing from round to round, since this information was not available in the other conditions.) This condition was meant to reproduce the incentive effects and the externality effects of the priority condition without affecting the allocation of B units. This condition was run to investigate whether the priority rule was changing behavior as a result of the incentives associated with creating a club good. The rebate amounts were selected to be the expected value of receiving priority in the priority condition of the experiment. The rebate consequently depended on the number of other donors (just as the benefits of priority depend on the number of other donors and how many others in need of B units also have priority). The rebate amounts were the expected benefit of having priority given the probability of A unit and B unit failure in the experiment. The rebate was weakly increasing and concave in the number of other donors in that round. Subjects received no rebate if they were the only donor and received up to $0.46 if 10 or 11 other subjects in their group were donors in that round.17 This meant that at the time of the donation decision, the private incentives in the rebate condition matched the private expected value of the incentives in the priority condition. Like being a donor in the priority condition (in which B units are more likely to go to other donors), being a donor in the rebate condition had a relatively strong positive externality on other donors, which distinguishes it from the discount condition. Subjects were not told how many rounds they would play the game, but all subjects played 15 rounds in one of the conditions followed by 16 rounds in another condition. All subjects played the control condition either for the first 15 or last 16 rounds (36 subjects, in 3 groups, played the control condition in all 31 rounds to test for a restart effect). After the first 15 rounds, subjects were informed that the rules of the game had changed and any changes in the game were explained. Three groups of subjects who had played the first 15 rounds in the control condition were stopped after round 15 and told that there were no changes in the rules of the game. After round 30, all groups were interrupted and told that they would play the game 1 final time (in the same condition they had been playing for the past 15 rounds). The number of groups who played in each of the orderings of conditions is displayed in Table 2. After all rounds had been played, subjects were informed of which four rounds had been randomly selected for payment and were informed of any rebate earnings in those rounds (if subjects played in the rebate condition). All subjects were paid in cash at the end of the experiment.

* Extra:
  + If multiple subjects had been waiting the same number of periods and there were not enough B units for all of them, the B units were assigned randomly among the subjects who had been waiting the longest.
  + Since the average donation rate across all rounds of the discount condition turns out to be 55.4 percent (implying an average of 6.65 donors per round), this $0.35 discount turns out to be remarkably similar to the benefit from donating they would have received from donating in the priority condition (in expectation), and to the rebate donating subjects would have received if they had been in the rebate condition, described next.
  + The expected value of receiving priority was calculated by simulating one million rounds of the game for each number of donors from 1 to 12 and estimating the earnings of subjects who were given priority and those who were not conditional for each number of donors. The rebate profile was: $0 for 0 other donors, $0.10 for 1 other donor, $0.20 for 2 other donors, $0.28 for 3, $0.33 for 4, $0.37 for 5, $0.40 for 6, $0.42 for 7, $0.44 for 8, $0.45 for 9, and $0.46 for 10 or 11 other donors. Note that the return to donation is increasing in the number of other donors up to 11, reflecting that with these parameter choices there remains a shortage of kidneys even when all possible donors are registered. (If there were excess kidneys, so that the queue was always empty, priority on the queue would no longer be valuable.)