

?-th person paradox: Solution and criteria

- (a) If we consider the definitions of 'speaker(s) and other(s)', 'addressee(s) and other(s)', the asymmetry that emerges is that 'we' can include the addressee, while 'you.pl' cannot include the speaker.

This step was relatively easy to do. However, to proceed, it was important to put it as the asymmetry between the first and second persons, and to indicate that it was the second person that was problematic. Indeed, in 'speaker(s) and other(s)', other(s) may easily include the addressee, because 'other(s)' is a non-binding description. This definition of 'we' is unproblematic. It is the definition of 'you.pl' as 'addressee(s) and other(s)' that is problematic because it is unclear which part of the definition accounts for non-inclusion of the speaker. Depending on the clarity of wording, this idea was graded 3 or 4 points (out of ten).

Quite a few participants argued that first person plural is more problematic because it is ambiguous, more difficult to interpret, because it may have two readings, inclusive and exclusive or similar. While it is true, this does not make the definition of 'we' as 'speaker(s) and other(s)' problematic (see above). Still, this remark was graded 1 point, because it was the first step in the right direction.

If the participant would additionally explicitly mention that, in her view, 'other(s)' cannot include the speech act participant (so the participant would explicitly apply a binding interpretation of 'the other(s)'), the grading was higher. While this was not the logic of the authors of the assignment, we acknowledge that this is a possible false track.

- (b) The next challenge was to get rid of this asymmetry and try and align the definitions of 'we' and 'you.pl' with each other and, more generally, with the 'X and other(s)' pattern. (One hidden reason for this is that, in theoretical linguistics, pronominal plurals usually tend to be aligned with other types of non-homogeneous plurals, such as associative plurals 'X and her family' etc.) There is but one way to do this - to use personal (alias locutive) hierarchies. In human language, the speaker often has a certain priority over the addressee, and both of them over the referents that are not speech act participants (Speaker > Addressee > Non-locutor).

The logic then is as follows. A plural personal pronoun follows the scheme of 'X and other(s)', but there is a certain hierarchy as to how this X, sometimes called the *focus*, can be chosen. When

referring to a group including the speaker, according to the hierarchy Speaker > Addressee > Non-locutor, it one cannot choose the Addressee as a focus. (If she could, she could use the second person plural pronoun!) In such cases, it is necessarily the Speaker who is chosen as X. Only when referring to a group that includes the addressee but not the speaker, the addressee can be chosen as X (the focus).

- (c) The third and final challenge was to extend your model to the languages with exclusive pronouns. As it is probably already clear by now, the inclusive languages follow a different hierarchy. They do not prioritise the speaker in their pronominal system; both the speaker and the addressee are equally prominent. It is still true that 'you.pl' cannot include the addressee, because the addressee is not higher than the speaker. But it is also true that 'we' (exclusive) cannot include the addressee. To designate a group including both the speaker(s) and the addressee(s), the speaker has to choose a special, inclusive pronoun, which has the focus comprising both act participants. For inclusive languages, the personal hierarchy that has to be posited is Speaker=Addressee>Non-Locutor.

Steps (b) and (c) were only done by two participants, and in both cases in a not-very-explicit, challengeable way; and somehow distributed between (b) and (c) (a fuller (b) in one case; a less complete (b) but a reasonable attempt at (c) in the other case). These steps were thus graded together, and, if they were done, the total grade for this task was 7 and 9, depending on the clarity of wording. No one was awarded the full grade.

Some additional remarks.

Honorific uses of the first person are good point, but in this sense second person is equally problematic, because the even more frequent uses of second person plural for singular as a strategy of politeness also do not fit into the definition of 'addressee(s) and other(s)'.

A few participants who figured out in which way the second person plural was problematic, suggested to include 'but not the speaker' into its definition, or some similar roundabout. However, this cannot count as a solution to (b) because it does not solve the problem of asymmetry between first and second person (cf. 'the

speaker(s) and the other(s)' vs. 'the addressee(s) and the other(s) but not the speaker(s)'). This approach only results in hardwiring the difference into the definition of the second person plural pronoun.

Rotation: Solution and criteria

Let us number ministers from 1 to 5. Then the set of rules is a permutation P of numbers 1-5 which means that the minister who is in the i -th ministry today will go to the P_i ministry tomorrow. We can see that the permutation P can be defined by splitting the ministers into several cycles, and inside each cycle the ministers switch respectively: $1 \rightarrow 2, 2 \rightarrow 3, \dots, n \rightarrow 1$, where n is the number of ministers in the cycle.

Let us see in how many days the ministers will return into a position they had before. It is obvious that if a cycle has a length of n , it will be coming into the original position every n days, i.e. it will be in the original position after m days if and only if m is divisible by n . That means that the first day when all the cycles will come into original positions, i.e. all ministers will come into their original positions, will happen on the first day the number of which is divisible by the lengths of all cycles, i.e. the least common multiple of the lengths of the cycles (lcm below).

A (3 Points out of 10) We can split the 5 ministers into two cycles of 2 and 3, ($P = \{2, 1, 4, 5, 3\}$). The lcm of the lengths is 6, which is sufficient for 6 days. Hence, the answer for (a) is yes.

Note 1: for A, the full point was given to a solution who gave an example of a set of rules (P) that correspond to the statement, discussing cycles or permutations was not required here.

Note 2: for A, 1 point was given to those who argued that the maximum number of days without repetitions was 5 by providing an example of one cycle of length 5 ($P = \{2, 3, 4, 5, 1\}$).

B (7 Points out of 10) In this part, we have to find the optimal choice of cycles so that the lcm of their lengths is maximized. Let us check different possibilities for the length l of the biggest cycle.

If $l = 6$, the answer is 6.

If $l = 5$, we have two cycles: 5 and 1, the answer is 5.

If $l = 4$, we have two cycles (4, 2), answer 4, or three cycles (4, 1, 1), answer 4

If $l = 3$, we have two cycles (3, 3), answer 3, three cycles (3, 2, 1), answer 6, or four cycles (3, 1, 1, 1), answer 3.

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If $l = 2$, we have three or more cycles, but their lengths are not bigger than 2, therefore their lcm is 2, so the answer is 2.

If $l = 1$, we have 6 cycles of lengths 1, answer is 1.

We can see that the best answer is 6, there are two possible choices of cycle lengths: (6), (3, 2, 1).

Note 1: full point for B was given to those who came up with some analysis of the possible lengths of the cycles using lcm.

Note 2: 5 points for B was given to those who came up with a similar analysis via the lengths of the cycles but with minor inaccuracies (e.g., used product instead of lcm or ignored some cases without sufficient explicit motivation).

Note 3: 1 points for B was given to those who provided an example of permutation without showing 6 was the maximum.

A common mistake was ignoring that the rules cannot change from day to day. If they could, the answer for A would be yes and the answer for B would be $6! = 720$.