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# **Multi-Agent Model for Formation of Inclusive Community through Social Intercourse for the Weak represented by Elderly**

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Due to the increase of single elderly households, living difficulties and lonely death due to isolation is becoming social issues. The purpose of this research is to clarify the condition for holding up the local community which is inclusive of elderly people who are at high risk of social exclusion. We used agent-based simulation to find out the conditions for maintaining a stable social inclusion.

We believe that the cooperative relationships are formed through social intercourse in the local community, and such relationships should be the basis for creating social inclusion.

Therefore, we modeled a community that carries out two different kinds of cooperative games: an interactive game based on direct reciprocity and an inclusive game based on indirect reciprocity. The results showed that the conditions for realizing social inclusion are: a) the number of interactive games exceeds the number of inclusive games, and b) social learning progresses gradually.

Therefore, we suggested that the establishment of cooperative relations based on direct reciprocity serves as the basis for creating social inclusion.

Instead of thinking in the direct reciprocal way to get the benefits matched the cost, it can be said that it is effective to think in the indirect reciprocal way as “someone may see my act of helping, not only the person whom I helped, so I might be helped someday” and to recommend taking a “socially (collectivistic)” idea to maintain a community that becomes the basis for regularizing the relationship that provides such indirect cooperation.

For those who only moved by directly reciprocity, it is important to continue telling stories that have good results from indirect reciprocity. To tell a story that indirect reciprocity has good results may also be related to slowly learning as in education, rather than instant imitation that jumps to immediate profit. It is difficult to change quickly, but in the end, the imitation probability of everyone may be lowered, leading to the increase in cooperation in the inclusive community.