

The secret ingredient for cooking a cooperative social system is... a pinch of conflict!

Endogenously formed intergroup competition can self structure a social environment that supports cooperation

The evolution of cooperation depends on the structure of the social environment. But we do not know how social environments that support cooperation adaptively self structure under different conditions.



Research has mostly considered 'pre-cooked' social environments that are exogenously imposed on a population.

We need to better understand the 'cooking' process by allowing social structures to build themselves.

We can then identify the important principles and processes involved in the formation of cooperative social environments.

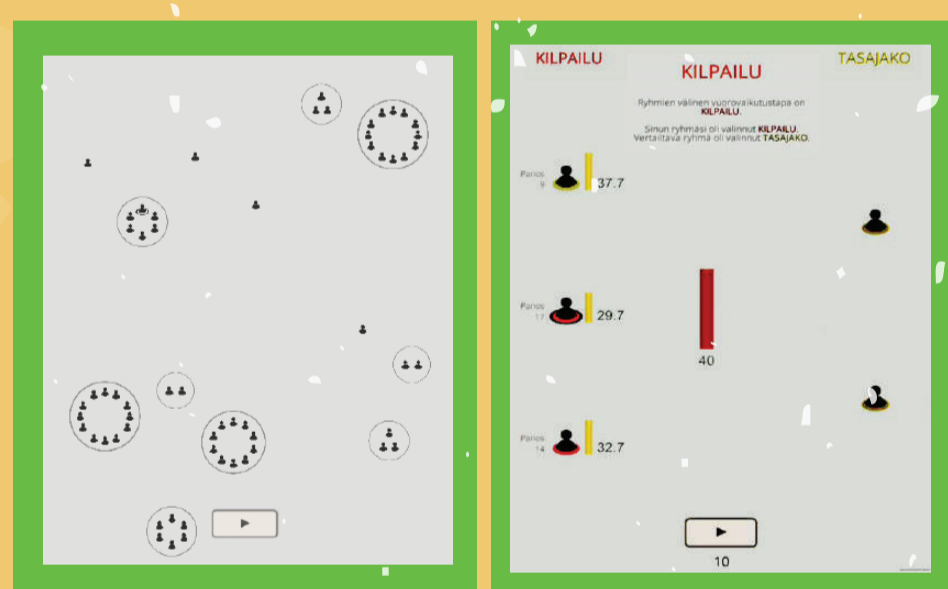


What role does between group interaction have in the emergence of social structures that benefit cooperators?

We presented humans with a social dilemma between costly cooperation and maximising their own payoff, whilst allowing them to shape the social context of this dilemma through grouping decisions.

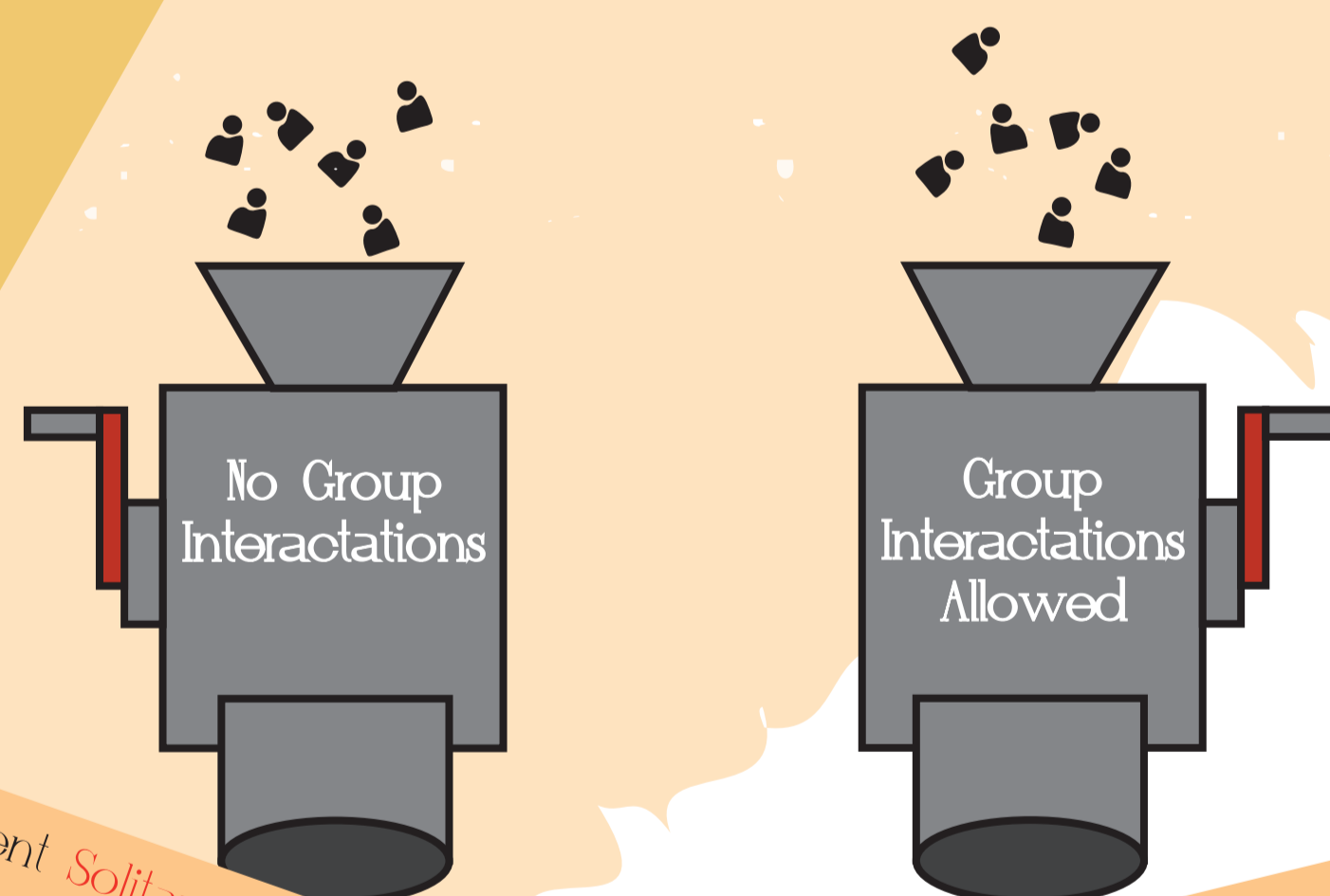
We allowed for the endogenous emergence of a group structured population by giving subjects the option to define their preferred group size.

Each group faced an internal social dilemma in the form of a public goods game.



Additionally, individuals could vote for how their group would interact with a randomly paired partner group. They could do nothing, share their earnings or compete to steal earnings.

Control conditions disallowed the potential for intergroup interactions.



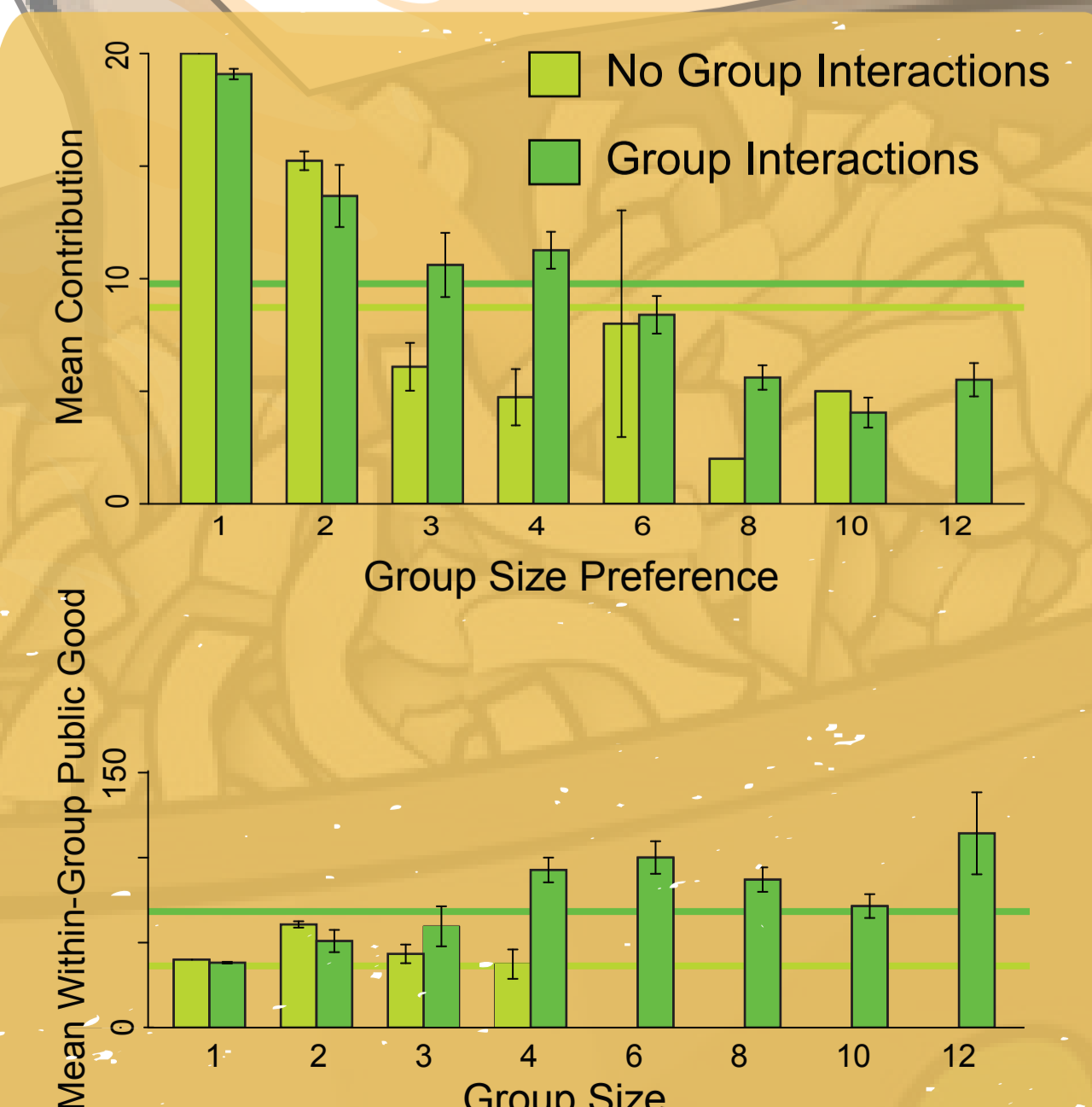
We find that group competition may be required for the endogenous emergence of a group structured population characterised by local cooperation and global competition.

However, group competition is not sufficient for the emergence of consistent increases in group size as seen in long term patterns of historical humans.

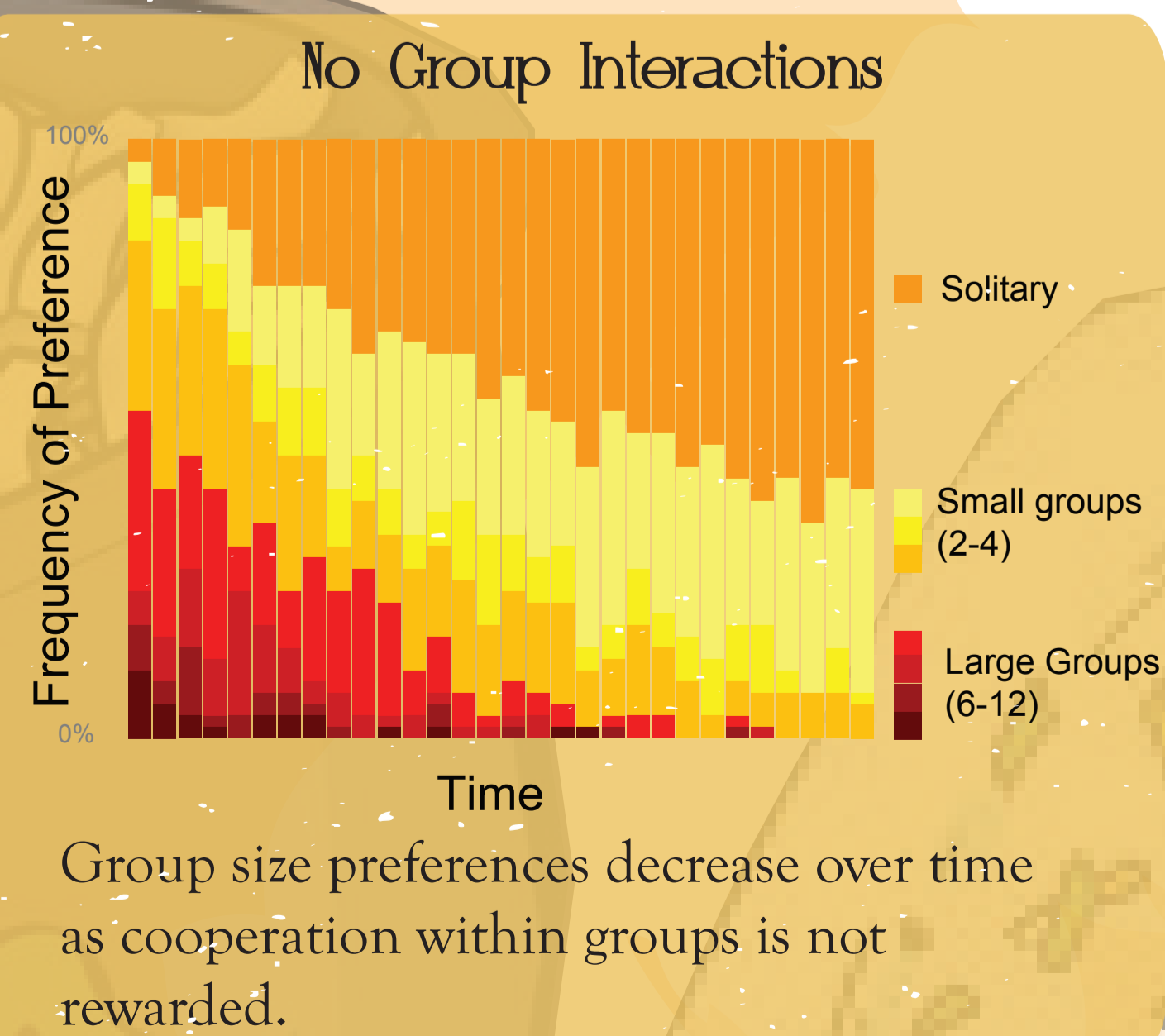
Players from an environment without group interactions choose not to join groups and thus a cooperative environment is not sustained.



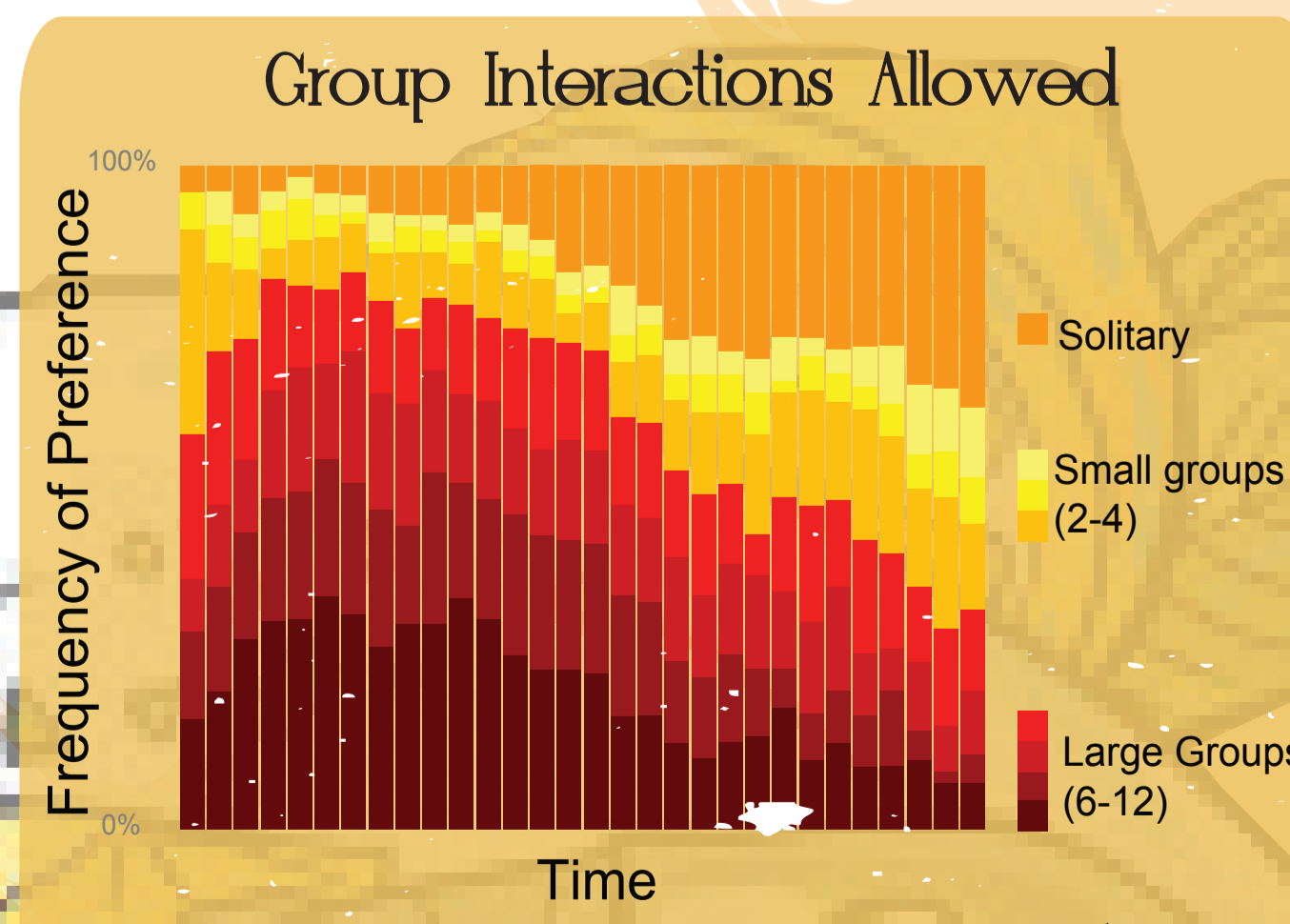
If group interactions are allowed, players form groups to dominate or protect each other. Individuals tended to cooperate within their group.



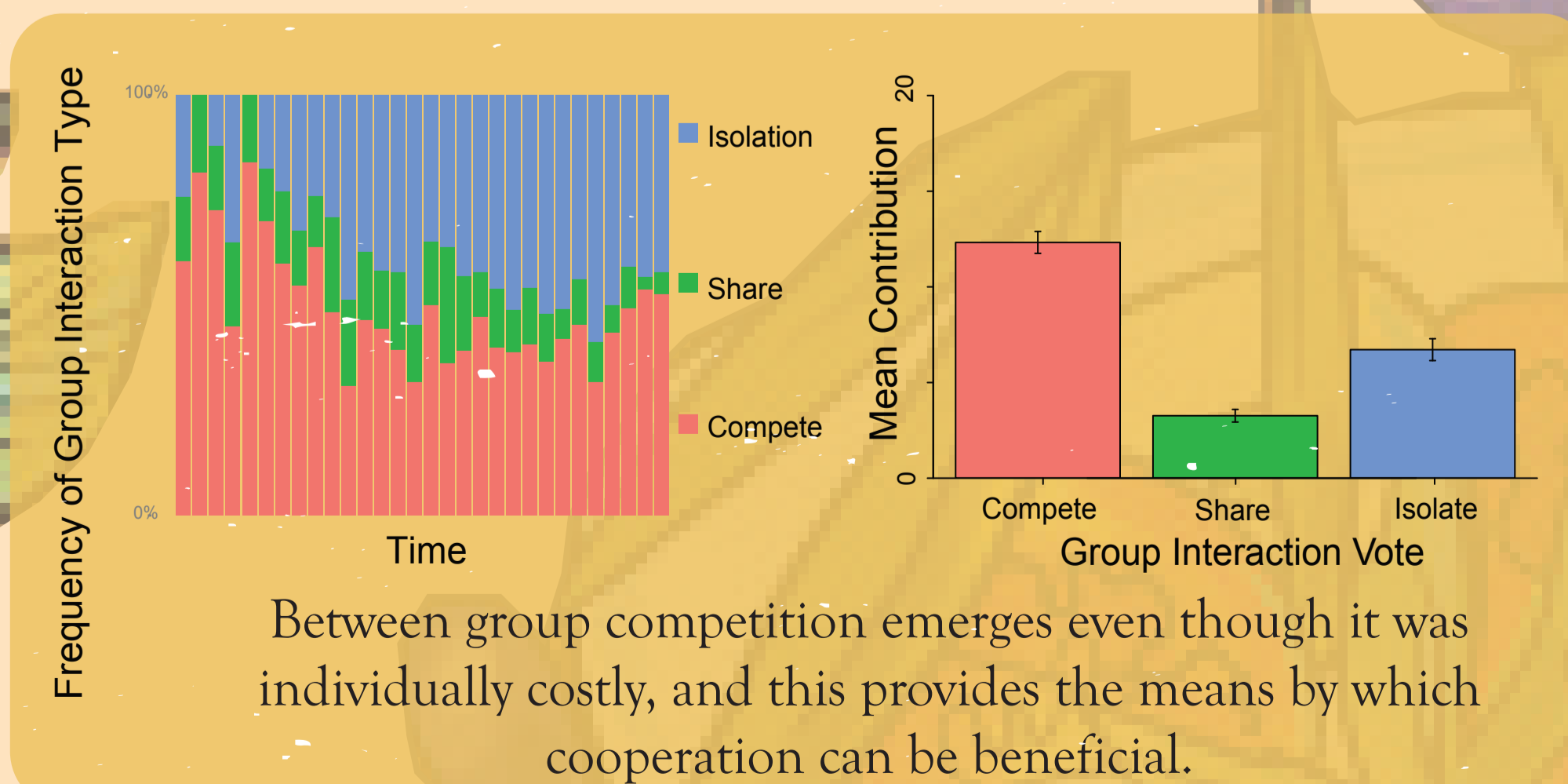
Groups were able to sustain a cooperatively generated public good up until the end of the game at both individual (top) and group (bottom) levels.



Group size preferences decrease over time as cooperation within groups is not rewarded.



Preferences for groups are maintained, although preference for larger groups declines. Thus, between group interactions may be insufficient for explaining the rise of group size over modern human history.



Between group competition emerges even though it was individually costly, and this provides the means by which cooperation can be beneficial.