

Participants converge to humans but not to humanoid robots in an English past tense formation task

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Convergence studies demonstrate that speakers imitate one another's behaviours in a wide range of language domains, from accent to choice of grammatical construction (Giles & Coupland 1991, Garrod & Pickering 2004). However, little is known about imitative behaviours in morphology below the word level (with notable exceptions, including Szmrecsanyi 2005). In this study, we investigate social effects on inflectional variation, with an experiment based on Asch's (1951) landmark work on peer influence.

In Asch's experiment, participants provide visual judgements after hearing a round of responses from other individuals; these individuals are in fact experimental confederates who consistently give incorrect responses. Similarly, in the present experiment, participants provide judgments while in the presence of confederate peers; we replicate Asch's original visual task, and supplement it with a linguistic task. The visual task requires judging the length of lines, as in Asch (1951); the linguistic task requires subjects to provide the past tenses of English verbs. The stimulus verbs include those which show variation between regular and irregular forms (e.g., *dived* and *dove* are both in common use), and those which are always irregular (*go—went*). The confederates consistently provide regular *-ed* past tense forms, even in cases where such usage violates grammatical norms (*go—goed*).

To provide a reference point for the effects of social influence, as distinct from morphological priming, a second set of subjects participates in the tasks alongside a group of 'confederate' robot peers. A third set of subjects provides baseline responses, absent any peer influence. There were a total of 78 participants, all students at the University of Canterbury; 23 with human confederates, 19 with robot confederates, 18 in the linguistic task baseline, and 18 in the visual task baseline.

In the linguistic task, participants regularized verbs significantly more in the human peer-group than in the baseline or the robot peer-group. There is no significant difference between the baseline and the robot peer-group. This provides evidence that morphological convergence can occur, and that it has an important social component. The observed regularization is not simply an effect of automatic asocial priming. Convergence with the human peer group is more common for the variable verbs, as predicted; however, human peers were also influential enough to prompt regularizations of verbs that are always irregular in normative use. For participants in the human peer-group (but not the robot peer-group), conforming to the group in the visual task is a predictor of the same subject's performance in the spoken task, providing evidence of a link in social imitation across different behavioural domains.

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