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Differences in the Representation of Physical and Social Causation

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Most approaches to causation, including probabilistic, counterfactual, and mechanistic accounts, treat physical causation as essentially the same as social causation. Evidence from language, however, indicates that these two kinds of causation may differ. For example, there exists a group of periphrastic causative verbs that is restricted to describing interactions between two people, that is, social causation, as in *bribe, compel, convince, discourage, dissuade, drive, have, impel, incite, induce, influence, inspire, lead, move, persuade, prompt, push, rouse,* and *send.* Interactions between people are the largest subclass of the periphrastic causative verbs, suggesting that these social interactions may have special status.

One approach of causation that may specify distinctions between physical and social causation is *force dynamics*. Force dynamics holds that people think about causal relationships as configurations of force (Talmy, 1988). One force is associated with an *affector*, that is, the entity that acts on another entity. Another force is associated with the *patient*, the entity that is acted on by the affector. A third force is the resultant that is produced from the addition of these two forces. The difference between physical and social causation appears to concern how these configurations unfold over time.

In physical causation, the forces associated with the causer and the patient are in opposition at both the beginning and the end of the interaction. For example, when the wind causes a boat to move across the water, water resistance opposes the boat's tendency from start to finish. However, in social causation, the nature of the interaction can change. For example, if we were to say *Peter persuaded Sally to leave the room*, we imply that at the beginning of the interaction, Peter and Sally were in opposition but that by the end of the interaction the two were in concordance, that is, that they had come to some kind of mutual agreement. Many of the verbs describing social causation imply this shift from opposition to *shared cognition*.

The semantics of physical and social periphrastic causative verbs was examined in a series of sorting and rating tasks (Klettke, 2004). Participants sorted sentences from the British National Corpus that contained 18 periphrastic causative verbs. Verbs describing physical causation were well fit by a two-dimensional multidimensional scaling solution, as reported previously in the literature (Wolff & Song, 2003). Of special note was that verbs describing social causation required an additional dimension, suggesting that causal interactions between two people are more complex than interactions between two non-sentient entities.

A series of rating tasks was conducted to investigate the semantics of verbs depicting social causation. Separate groups of participants rated the sentences used in the sorting task with respect to shared cognition, intention of the causer, intention of the patient, spatial contiguity, temporal contiguity, and directness of causation. As shown in Table 1, only the factors of shared cognition and intention of the patient correlated significantly with the third dimension.

Table 1: Correlations with 3rd dimension

	Shared Cog	Intent Cause	Intent Patnt	Spat Cont	Temp Cont	Direct Cause
3rd Dim.	-0.87*	-0.35	0.77*	0.20	0.31	-0.53

Note. Significant correlations for $p < .05$ are marked with an asterisk.

In a further analysis, a forward regression analysis indicated that shared cognition was the only one of the potential semantic factors that needed to be retained in the regression equation ($M = 58.68$, $F = 36.53$; $SEM = 4.427$, $p < .001$).

The results from these analyses indicate that social causation is more complex than that of physical causation. Whereas physical interactions are characterized by opposition from beginning to end, social interactions can result in mutual agreement, or sharing of cognition. In other words, social causation is more complex because interactions between people are associated with a greater range of interactions than interactions between physical entities and a possible shift from opposition to shared cognition.

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