Testing Instrument Validity in Peer-Effects Models

Martin Huber[1] · Jannis Kück[2] · Lukáš Laffers[3] · Anna Schmidt[2] | [1]Fribourg · [2]HHU Düsseldorf · [3]Slovak Academy of Sciences

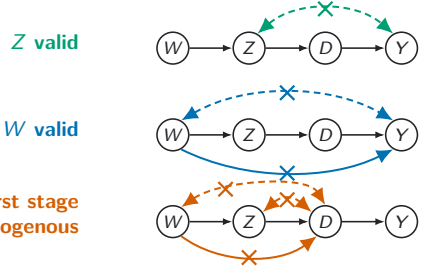
Can peer-effect instruments be tested?

Dependent variable Y: own outcome. Treatment D: friends' outcome, endogenous, so it is instrumented by a variable Z of friends' friends (following Bramoullé et al. 2009). This fails if unobservables drive both friendships and outcomes (Johnsson & Moon 2021).

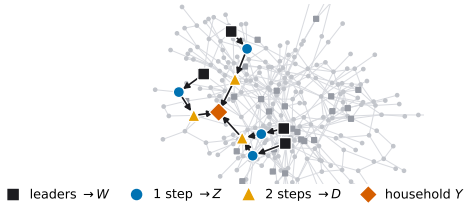
Yes: a more distant peer W makes it testable

Given the causal order, relevance and exclusion of Z:

$Y \perp\!\!\!\perp W \mid Z, X$ and $D \perp\!\!\!\perp W \mid Z, X \iff$ all three hold:



High-dimensional X allowed (Huber & Kück 2022).



Microfinance in 43 Indian villages

	$Y \perp\!\!\!\perp W \mid Z, X$	$D \perp\!\!\!\perp W \mid Z, X$
help with decisions	.444 / .884	.437 / .194
give advice	**.016** / .411	.245 / .710

p-values: least squares / doubly robust. Data: Banerjee et al. (2013).

Simulated: correct size, high power on direct effects.

Power against Z validity rises with the $W \to Z$ link: even a hidden confounder becomes detectable.

Exclusion of Z is testable too

With binary D, condition on the propensity score instead of Z, under local irrelevance.