

# Do Lego guns cause crime?

*A light-hearted review of case-control, cohort, and RCT study designs*

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**T**he scene opens with Rush Limburger, notorious right-wing activist, and Michael Moor, roguish left-wing political writer, stuck in a top-secret research facility. The screech of rhesus monkeys can be faintly heard from down the hall.

**Rush Limburger:** Why are we locked up here together in this office anyway?

**Michael Moor:** I'm sure it had something to do with the fact that you were giving away toy guns outside a kindergarten classroom.

**Rush Limburger:** It is a dangerous world out there. Kids have to start learning to take care of themselves and that they can't always rely on the government. And because you were "protecting" them by taking away their Lego blocks to keep them from building guns, someone had to help those poor little tykes ...

So what happens now?

**Michael Moor:** Apparently we are going to be locked up here, together, until we come up with a research design to determine whether or not giving small boys toy guns causes them to commit crimes when they grow up. The governor calls it "evidence-based public policy."

**Rush Limburger:** It'll never catch on.

**Michael Moor:** In any case, we don't get out until we come up with a proposal.

**Rush Limburger:** Well it seems pretty stupid to me. I know how you research people do this. You do a "randomized controlled trial." You pick a kindergarten class and give half of the kids toy guns and not the other half, then see who commits more crimes. You control the "intervention" and watch for "outcomes."

Of course this cannot be done. It is unethical to withhold guns from law-abiding citizens, even if they can't yet tie their shoes. The kids with the guns will obviously share them with the kids without guns. Third, kindergarten kids won't be committing crimes for a long time. Therefore the research cannot be done. And *therefore* we should use common sense, which dictates that unprotected kids will get shot at

more than kids with guns so we should train them early to keep them safe.

**Michael Moor:** That is your idea of logic, is it? The ideal trial can't be done, meaning there's no evidence, leaving you free to insert your own bizarre ideas.

I say let's do a cohort study. Let's observe how often kids in kindergarten play with toy guns. Then we can divide them into a cohort of frequent players and a cohort of infrequent players and watch their criminal records. We don't control the intervention, but we identify 2 groups that are similar except for the intervention, or exposure (as the experimenter isn't controlling it), then watch for outcomes.

**Rush Limburger:** Nope. No fair. The 2 "cohorts" will be different in many more ways than whether or not they like to play with guns. I'm sure that kids from the tough part of town play with guns more often because they know they'll have to defend themselves one day. They will be poor, school dropouts, and from broken homes. And it won't be because they played with toy guns. Some things just go together.

**Michael Moor:** We can statistically correct for education, ethnicity, socioeconomic status, and even neighbourhood.

**Rush Limburger:** But how can you correct for things you haven't even thought of? Like being a wimp or something. I know how this is supposed to work. If the 2 groups are going to be completely identical then you have to randomize them and assign them to groups of either guns or no guns. They can't choose. And you have to make sure that they don't change groups or drop out because that could ruin your randomization—the groups wouldn't be the same anymore.

**Michael Moor:** I think that a cohort study could be useful even if the cohorts were similar rather than identical. But whether we assign the gun-playing or not we'll still need to follow the kids for decades. That will take too much time and will also increase the likelihood that we lose some to follow-up. Furthermore, as most boys don't choose a life of crime, it will take a huge sample size to get enough criminals to be statistically significant.

Look, statistically adults with guns commit more crimes than adults without guns. Isn't that enough evidence? Surely if we take away everyone's guns then we will reduce crime.

**Rush Limburger:** You're changing the subject. We are talking about toys—remember? Anyway, just because 2 things go together doesn't prove that one is causing the other.

**Michael Moor:** You are right. Association does not prove causation definitively. But it does support an argument for causation.

So how about a case-control study design? Instead of starting out with the intervention we start with the outcome. We'll compare cases *with* the outcome with controls *without* the outcome and then look backward for the exposure. In this case we would have to find a bunch of criminals and a bunch of noncriminals who are otherwise similar and find out whether or not they played with toy guns in kindergarten.

**Rush Limburger:** How would you do that? If you ask a teacher whether a man played with guns in kindergarten 15 years ago she might already know whether he joined a gang or became an accountant. That might change her answer.

**Michael Moor:** That is called recall bias. We could deal with it by looking through old school records; or we could make sure the teachers didn't know what happened to the kids in question.


A case-control study can be done in a short period of time and it can be done with a much smaller sample size. It might not be perfect but it's better than intuition, which is the best you have to offer. It wouldn't prove cause and effect conclusively because we would not have assigned who would have played

with guns and who would not, but it would establish association; the exposure would occur and be measured before the outcome was known; and, there is already a plausible mechanism for toy guns to cause crime. Association, cause before effect, plausible mechanism. We're not randomly assigning the variable, but we would have 3 of the 4 factors required for establishing a cause-and-effect relationship. Not perfect maybe, but good enough. Case closed.

**Rush Limburger:** There is no conceivable mechanism by which plastic AK-47s could possibly cause crime.

**Michael Moor:** I cannot believe you said that. You are such a tool of the multinational, corporate-military-industrial complex. A cog in their machine!

**Rush Limburger:** [long shocked silence]

**Michael Moor:** Sorry ... I went too far ... Look, let's keep working at it. We'll get out of here yet. 

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None declared

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