Carl von Ossietzky
Universität
Oldenburg

Poisoned Babies, Shot Fathers, and Ruined Experiments

Alexander Max Bauer, 16.09.2023

Roadmap

(1) A Tale of Three Papers

(2) Livengood and Sytsma (2020): "Actual Causation and Compositionality"

(3) Bauer and Romann (2022): "Answers at Gunpoint"

(4) Bauer and Kornmesser (2023): "Poisoned Babies, Shot Fathers, and Ruined Experiments"

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy

A Tale of Three Papers

Poisoned Babies, Shot Fathers, and Ruined Experiments

Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy

---

Actual Causation and Compositionality

Jonathan Livengood and Justin Sytsma

DISCUSSION NOTE

Answers at Gunpoint: On Livengood and Sytsma's Revolver Case

Alexander Max Bauer and Jan Romann

ARTICLE

Poisoned Babies, Shot Fathers, and Ruined Experiments: Experimental Evidence in Favor of the Compositionality Constraint of Actual Causation

Alexander Max Bauer and Stephan Kornmesser

Livengood and Sytsma (2020): "Actual Causation and Compositionality"

Compositionality Constraint of Actual Causation: If *c* is an actual cause of *e*, then either *c* causes *e* directly, or every intermediary *d* by which *c* indirectly causes *e* is itself an actual effect of *c* and an actual cause of *e*. (Livengood and Sytsma 2020, p. 44)

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy
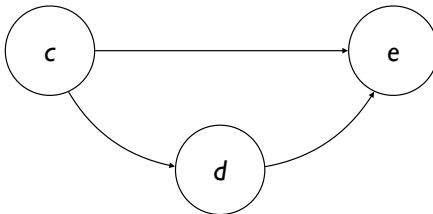
Livengood and Sytsma (2020): "Actual Causation and Compositionality"

Revolver Case: Trent has decided to kill his father, Brad. He aims his loaded revolver at Brad and pulls the trigger, releasing the hammer. The hammer strikes the cartridge, igniting the gun powder. The gun powder explodes, driving the bullet from the gun. The bullet hits Brad in the head. He dies instantly. (Livengood and Sytsma 2020, p. 59)

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy
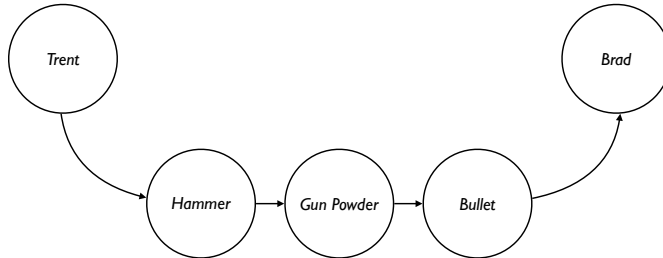
Livengood and Sytsma (2020): "Actual Causation and Compositionality"

Revolver Case

- $N = 51$
- (dis)agreement on 7-point scale
- 4 statements, i. e.,
  - (A) "Trent caused Brad's death."
  - (B) "The hammer caused Brad's death."
  - (C) "The gun powder caused Brad's death."
  - (D) "The bullet caused Brad's death."
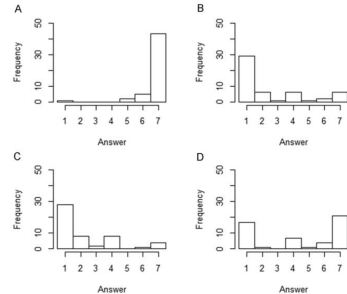
Figure 8. Histograms for study 8. *A*, Trent caused; *B*, hammer caused; *C*, powder caused; *D*, bullet caused.

Slide 6
16.09.2023

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy

Bauer and Romann (2022): "Answers at Gunpoint"

Events

8 different events, i. e.,

(A) "pulling the trigger"

(B) "releasing the hammer"

(C) "striking the cartridge"

(D) "igniting the gun powder"

(E) "the gun powder exploding"

(F) "driving the bullet from the gun"

(G) "the bullet hitting Brad in the head"

(H) "the death of Brad"

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy

Bauer and Romann (2022): "Answers at Gunpoint"

Combinations of events
28 "X caused Y" statements, e. g.,

(A/B) "Pulling the trigger caused the release of the hammer."

(C/D) "Striking the cartridge caused the ignition of the gun powder."

(F/G) "The bullet being driven from the gun caused the bullet to hit Brad in the head."

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy
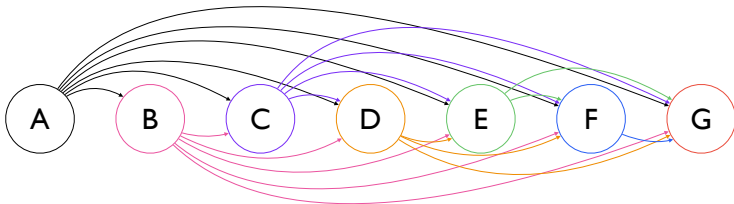
Bauer and Romann (2022): "Answers at Gunpoint"

Analogous Statements

(1) "Trent caused Brad's death."

(A/H) "Pulling the trigger caused the death of Brad."

(2) "The hammer caused Brad's death."

(B/H) "Releasing the hammer caused the death of Brad."

(3) "The gun powder caused Brad's death."

(D/H) "Igniting the gun powder caused the death of Brad."

(E/H) "The explosion of the gun powder caused the death of Brad."

(4) "The bullet powder caused Brad's death."

(F/H) "The bullet being driven from the gun caused the death of Brad."

(G/H) "The bullet hitting Brad in the head caused the death of Brad."

Slide 9
16.09.2023

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy

Bauer and Romann (2022): "Answers at Gunpoint"

Results

- $N = 52$
- (dis)agreement on 7-point scale
- 28 statements
- central tendency for no statement smaller than the "neutral" value 4
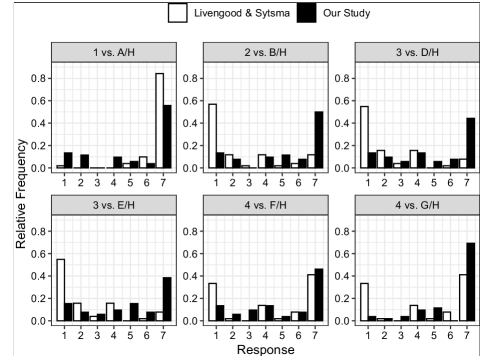
Bauer and Kornmesser (2023): "Poisoned Babies, Shot Fathers, and Ruined Experiments"

Possible Explanations

3 possible reasons for the difference

– The causality-responsibility confusion (CRC)

– The intermediary-ontology confusion (IOC)

– The cause-end questioning (CEQ)

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy

Bauer and Kornmesser (2023): "Poisoned Babies, Shot Fathers, and Ruined Experiments"

Design

- vignettes from Livengood and Sytsma (2020)
    - poisoned cup vignette
    - revolver vignette
    - GFCI vignette
- studies for each vignette
    - replication
    - exclusion of IOC
    - exclusion of CRC
    - exclusion of CEQ
    - simultaneous exclusion of IOC, CRC, and CEQ
- $N \approx 60$ for each study
- (dis)agreement on 7-point scale

Bauer and Kornmesser (2023): "Poisoned Babies, Shot Fathers, and Ruined Experiments"

Results

– replicating the original studies led to the same results Livengood and Sytsma (2020) got

– excluding IOC led to less disagreement that intermediaries were causes (for all vignettes)

– excluding CRC led to agreement that intermediaries were causes (for poisoned cup and revolver vignette)

– excluding the CEQ led to agreement that intermediaries were causes (for all vignettes)

– simultaneous exclusion of IOC, CRC, and CEQ led to agreement that intermediaries were causes (for all vignettes)

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy
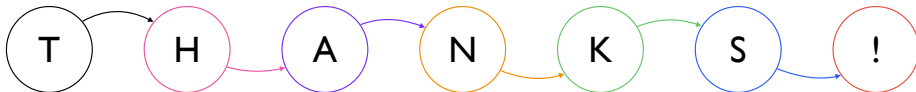
Bauer and Romann (2022): "Answers at Gunpoint"

Statement	Mean	Standard Error	95% Confidence Interval	Variance
A/B	5.89	0.26	[5.37, 6.40]	3.48
A/C	5.56	0.27	[5.02, 6.10]	3.74
A/D	5.33	0.28	[4.77, 5.88]	4.00
A/E	5.12	0.29	[4.54, 5.70]	4.34
A/F	5.19	0.28	[4.63, 5.75]	4.08
A/G	4.92	0.31	[4.31, 5.54]	4.86
A/H	5.17	0.33	[4.51, 5.83]	5.64
B/C	5.90	0.27	[5.37, 6.44]	3.70
B/D	5.67	0.25	[5.17, 6.18]	3.28
B/E	5.25	0.27	[4.71, 5.79]	3.80
B/F	5.17	0.28	[4.62, 5.73]	4.00
B/G	4.90	0.30	[4.31, 5.50]	4.56
B/H	5.21	0.31	[4.59, 5.84]	5.07
C/D	5.75	0.28	[5.18, 6.32]	4.19
C/E	5.54	0.26	[5.02, 6.05]	3.43
C/F	5.21	0.28	[4.65, 5.77]	4.01
C/G	4.69	0.31	[4.06, 5.32]	5.16
C/H	4.94	0.32	[4.29, 5.59]	5.47
D/E	5.94	0.27	[5.41, 6.48]	3.70
D/F	5.50	0.25	[5.07, 6.08]	3.27
D/G	4.94	0.30	[4.35, 5.53]	4.53
D/H	4.88	0.32	[4.24, 5.53]	5.32
E/F	5.92	0.26	[5.41, 6.44]	3.41
E/G	4.88	0.30	[4.28, 5.49]	4.70
E/H	4.79	0.31	[4.16, 5.42]	5.15
F/G	5.19	0.30	[4.59, 5.79]	4.63
F/H	4.96	0.32	[4.33, 5.60]	5.21
G/H	6	0.24	[5.53, 6.47]	2.86

Table 1: Summary of statements

Case	V	p
A/B	1079.00	< 0.001***
A/C	1058.50	< 0.001***
A/D	998.00	< 0.001***
A/E	842.00	0.001**
A/F	792.00	< 0.001***
A/G	872.00	0.004**
A/H	876.50	< 0.001***
B/C	1067.50	< 0.001***
B/D	978.50	< 0.001***
B/E	915.50	< 0.001***
B/F	794.00	< 0.001***
B/G	806.50	0.004**
B/H	869.00	0.001**
C/D	1152.50	< 0.001***
C/E	880.00	< 0.001***
C/F	891.50	< 0.001***
C/G	699.00	0.035*
C/H	697.50	0.005**
D/E	1134.00	< 0.001***
D/F	986.00	< 0.001***
D/G	905.00	0.004**
D/H	756.00	0.006**
E/F	1108.00	< 0.001***
E/G	722.50	0.007**
E/H	780.00	0.02*
F/G	849.00	< 0.001***
F/H	772.00	0.004**
G/H	1053.00	< 0.001***

Table 2: Two-tailed Wilcoxon signed-rank tests

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy

Bauer and Kornmesser (2023): "Poisoned Babies, Shot Fathers, and Ruined Experiments"

Study		Statement	N	M	95% CI	Versus Neutral Value			Versus Replication	
						z	p	r	z	p
Replication	(1)	"Gabi caused Nele's death."	71	6.859	[6.679, 7.039]	8.242	< 0.001***	1.166	—	—
	(2)	"Kathrin caused Nele's death."		2.000	[1.569, 2.431]	−5.952	< 0.001***	−0.842	—	—
IOC (1)	(1)	"Gabi's action of poisoning the sippy cup caused Nele's death."	67	6.522	[6.176, 6.868]	7.076	< 0.001***	0.865	1.918	0.055
	(2)	"Kathrin's action of giving Nele a poisoned sippy cup caused Nele's death."		3.447	[2.823, 4.072]	−1.424	0.155	−0.174	−3.587	< 0.001***
IOC (2)	(1)	"The action of poisoning the sippy cup caused Nele's death."	89	5.910	[5.514, 6.306]	6.648	< 0.001***	0.705	4.333	< 0.001***
	(2)	"The action of giving Nele juice with a poisoned sippy cup caused Nele's death."		4.640	[4.116, 5.164]	2.551	0.011	0.270	−6.441	< 0.001***
CRC	(1)	"Nele would not have died that evening if Gabi had not poisoned her sippy cup."	86	6.767	[6.618, 6.917]	8.783	< 0.001***	0.947	1.812	0.070
	(2)	"Nele would not have died that evening if Kathrin had not given her juice in a poisoned sippy cup."		5.953	[5.548, 6.359]	6.716	< 0.001***	0.724	−8.927	< 0.001***
CEQ	(1)	"Gabi's action of poisoning Nele's sippy cup caused Kathrin to give Nele juice in a poisoned sippy cup."	61	6.180	[5.714, 6.649]	6.145	< 0.001***	0.787	2.812	0.005**
	(2)	"Kathrin's action of giving Nele juice in a poisoned sippy cup caused Nele to ingest poison."		5.115	[4.501, 5.728]	3.413	< 0.001***	0.437	−4.678	< 0.001***
	(3)	"Nele's action of ingesting poison caused her death."		4.279	[3.599, 4.958]	0.596	0.551	0.076	—	—
Combination	(1)	"Kathrin would not have given Nele juice in a poisoned sippy cup if Gabi had not poisoned Nele's sippy cup."	59	5.102	[4.421, 5.782]	2.969	0.003**	0.387	5.008	< 0.001***
	(2)	"Nele would not have ingested poison if Kathrin had not given her juice in a poisoned sippy cup."		6.169	[5.695, 6.644]	5.814	< 0.001***	0.757	−8.237	< 0.001***
	(3)	"Nele would not have died that evening if she had not ingested the poison."		6.458	[6.101, 6.814]	6.609	< 0.001***	0.860	—	—

Table 1: Summary of statements for the poisoned cup vignette, reporting results of Wilcoxon signed-rank tests

Bauer and Kornmesser (2023): "Poisoned Babies, Shot Fathers, and Ruined Experiments"

Study		Statement	N	M	95% CI	Versus Neutral Value			Versus Replication	
						z	p	r	z	p
Replication	(1)	"Leave caused Uwe's death."	63	6.603	[6.285, 6.922]	7.108	< 0.001***	0.896	—	—
	(2)	"The hammer caused Uwe's death."		3.000	[2.410, 3.590]	−3.288	< 0.001***	−0.414	—	—
	(3)	"The gunpowder caused Uwe's death."		2.984	[2.402, 3.566]	−3.391	< 0.001***	−0.427	—	—
	(4)	"The bullet caused Uwe's death."		5.048	[4.399, 5.696]	2.826	0.005**	0.356	—	—
IOC	(1)	"Leave's action of shooting at Uwe caused Uwe's death."	54	5.648	[5.062, 6.234]	4.404	< 0.001***	0.599	3.367	< 0.001***
	(2)	"The release of the hammer caused Uwe's death."		3.667	[2.988, 4.346]	−0.921	0.357	−0.125	−1.754	0.0795
	(3)	"The explosion of the gunpowder caused Uwe's death."		3.593	[2.917, 4.269]	−1.230	0.219	−0.167	−1.563	0.1181
	(4)	"The bullet hitting Uwe caused Uwe's death."		6.241	[5.770, 6.712]	5.766	< 0.001***	0.785	−2.767	0.006**
CRC	(1)	"Uwe would not have died if Leave had not shot at him."	50	6.480	[6.049, 6.911]	5.943	< 0.001***	0.841	0.410	0.6819
	(2)	"Uwe would not have died if the hammer had not been released."		6.120	[5.582, 6.658]	5.339	< 0.001***	0.755	−6.615	< 0.001***
	(3)	"Uwe would not have died if the gunpowder had not exploded."		5.720	[5.110, 6.330]	4.463	< 0.001***	0.631	−5.855	< 0.001***
	(4)	"Uwe would not have died if the bullet had not hit Uwe."		6.160	[5.633, 6.687]	5.165	< 0.001***	0.730	−2.505	0.012
CEQ	(1)	"Leave's action of shooting at Uwe caused the release of the hammer."	53	4.962	[4.270, 5.654]	2.565	0.0103*	0.352	4.399	< 0.001***
	(2)	"The release of the hammer caused the explosion of the gunpowder."		5.830	[5.272, 6.389]	4.911	< 0.001***	0.675	−6.015	< 0.001***
	(3)	"The explosion of the gunpowder caused the bullet to hit Uwe."		5.056	[4.396, 5.717]	2.943	0.003**	0.404	−4.471	< 0.001***
	(4)	"The bullet hitting Uwe caused Uwe's death."		6.547	[6.170, 6.924]	6.376	< 0.001***	0.876	−3.748	< 0.001***
Combination	(1)	"The hammer would not have released if Leave had not shot at Uwe."	50	6.380	[5.858, 6.702]	5.969	< 0.001***	0.820	1.682	0.0926
	(2)	"The gunpowder would not have exploded if the hammer had not released."		6.520	[6.194, 6.846]	6.232	< 0.001***	0.856	−7.377	< 0.001***
	(3)	"The bullet would not have hit Uwe if the gunpowder had not exploded."		6.120	[5.680, 6.560]	5.725	< 0.001***	0.786	−6.757	< 0.001***
	(4)	"Uwe would not have died if the bullet had not hit Uwe."		6.140	[5.670, 6.610]	5.593	< 0.001***	0.768	−2.294	0.0218

Table 2: Summary of statements for the revolver vignette, reporting results of Wilcoxon signed-rank tests

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy

Bauer and Kornmesser (2023): "Poisoned Babies, Shot Fathers, and Ruined Experiments"

Study		Statement	N	M	95% CI	Versus Neutral Value			Versus Replication	
						z	p	r	z	p
Replication	(1)	"The pipe bursting caused the experiment to be ruined."	60	5.483	[4.902, 6.065]	4.369	< 0.001***	0.564	—	—
	(2)	"The GFCI breaking the circuit caused the experiment to be ruined."		4.117	[3.434, 4.799]	0.403	0.6871	0.052	—	—
IOC	(1)	"The pipe bursting caused the experiment to be ruined."	64	5.734	[5.236, 6.232]	5.310	< 0.001***	0.664	−0.556	0.5781
	(2)	"The breaking of the circuit by the GFCI caused the experiment to be ruined."		4.234	[3.596, 4.873]	0.658	0.511	0.082	−0.122	0.9028
CRC	(1)	"The experiment would not have been ruined if the pipe had not burst."	67	6.164	[5.771, 6.557]	6.484	< 0.001***	0.917	−1.760	0.0785
	(2)	"The experiment would not have been ruined if the GFCI had not broken the circuit."		3.358	[2.720, 3.996]	−1.794	0.0728	0.254	1.566	0.1173
CEQ	(1)	"The bursting of the pipe caused the GFCI to break the circuit."	64	6.094	[5.619, 6.568]	6.039	< 0.001***	0.755	−2.155	0.0312
	(2)	"The breaking of the circuit by the GFCI caused the special light to turn off."		6.250	[5.834, 6.665]	6.317	< 0.001***	0.790	−4.842	< 0.001***
	(3)	"The special light turning off caused the experiment to be ruined."		6.188	[5.785, 6.590]	6.628	< 0.001***	0.828	—	—
Combination	(1)	"The GFCI would not have broken the circuit if the pipe had not burst."		6.559	[6.220, 6.899]	6.780	< 0.001***	0.883	−3.391	< 0.001***
	(2)	"The special light would not have turned off if the GFCI had not broken the circuit."	59	6.186	[5.734, 6.639]	5.949	< 0.001***	0.775	−4.619	< 0.001***
	(3)	"The experiment would not have been ruined if the special light had not turned off."		5.915	[5.438, 6.393]	5.308	< 0.001***	0.717	—	—

Table 3: Summary of statements for the GFCI vignette, reporting results of Wilcoxon signed-rank tests

Slide 18
16.09.2023

Poisoned Babies, Shot Fathers, and Ruined Experiments
Alexander Max Bauer – University of Oldenburg, Faculty IV, Department of Philosophy