MP Suppression and Belief Revision, two sides of the same coin?

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Introduction

MP Suppression. Byrne (1989) showed that the Modus Ponens (MP) inference was suppressed by adding a logically irrelevant, but semantically relevant, premise to the classical MP-problems (if A, then B, A). She presented participants with statements as follows:

> *If it rains, then M. will get wet*
> *If she walks outside, then M. will get wet*
> *It rains*

The semantic relevance of the second premise lies in the fact that it triggers a possible exception to the first premise (namely, staying inside). Given A, participants (pps) become uncertain whether the more specific rule applies here or not, resulting in fewer persons accepting the MP conclusion B. Thus, although no direct conflict is apparent and one could easily deny the second conditional premise, the additional information is taken into account as a disabler and creates an inconsistent state that pps wish to resolve.

Cummins et al. (1991) showed that the more disablers one can think of, the more suppression of MP takes place.

Belief Revision. Elio (1997) showed that when MP was explicitly denied, pps lowered their belief in the conditional premise. She presented pps with statements as follows:

Initially, you believe
> *If it rains, then M. will get wet*
> *It rains*
> *From this, you believe M. gets wet*

You do further investigation and discover:
> *M. does not get wet*

In accordance with Cummins et al. (1991), she also showed that the more disablers one could imagine, the lower the degree-of-belief in the conditional.

Experiment

We repeated the experiment of Byrne (1989, exp. 1) and of Elio (1997, exp. 1) with causal conditionals with many and few disablers in a 2X2 within subject design (task [Suppression - Belief Revision] X Disablers [Many - Few]). The selection of the 14 conditional items is based on De Neys et al. (2003).

As in former experiments, we observed a main effect of Many vs. Few disablers ($F(1,104)=35.49$, $p < .0001$).

For each cell, we created seven groups based on the pps' mean score. E.g., pps with a mean score on the Many-Suppression items below or equal to 1 were attributed to Group1; pps with a mean score below or equal to 2 were attributed to Group2, etc.

Table 1: Distribution in both tasks with few disablers (N=105).

Few (3 items)	Suppression (Mean score: 4.75)						
Belief Revision (Mean score: 5.07)	1	2	3	4	5	6	7
1	0	0	0	1	0	0	0
2	0	0	0	1	0	1	0
3	0	0	0	2	2	0	0
4	0	0	0	3	4	0	1
5	0	1	2	1	4	6	2
6	0	0	1	5	9	11	10
7	0	2	1	4	8	16	7

As shown in Tables 1 and 2, pps react equally on both tasks. Resp. 24% and 30% of the pps score exactly the same in both tasks, resp. 70% and 85% of them score the same ± 1. Thus, the data confirm that conditional reasoning and belief revision are two sides of the same coin, and it indicates that the same processes (e.g., looking for background knowledge) play a role in this.

Table 2: Distribution in both tasks with many disablers (N=105).

Many (4 items)	Suppression (Mean score: 4.85)						
Belief Revision (Mean score: 5.52)	1	2	3	4	5	6	7
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	1
3	0	1	1	4	3	2	1
4	0	0	1	3	6	0	0
5	0	2	0	10	8	6	1
6	0	0	3	3	23	16	5
7	0	0	0	0	0	1	4

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