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Improving Trace-Based Propagation of Feature Annotations in Model Transformations

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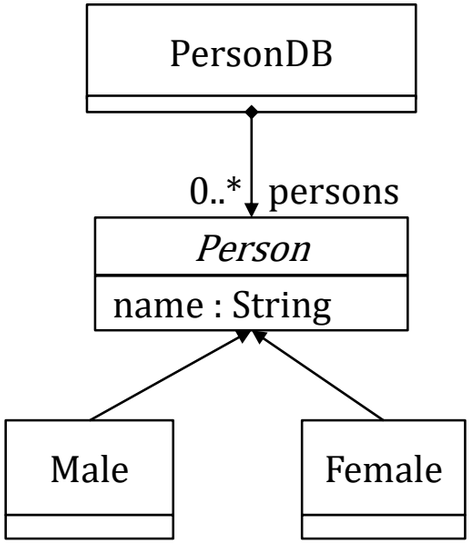
Sandra Greiner and Bernhard Westfechtel

Applied Computer Science I
University of Bayreuth

Background: MVMTs

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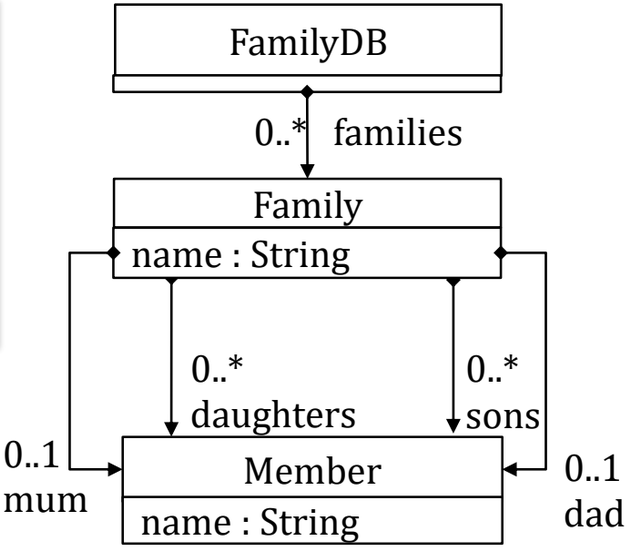
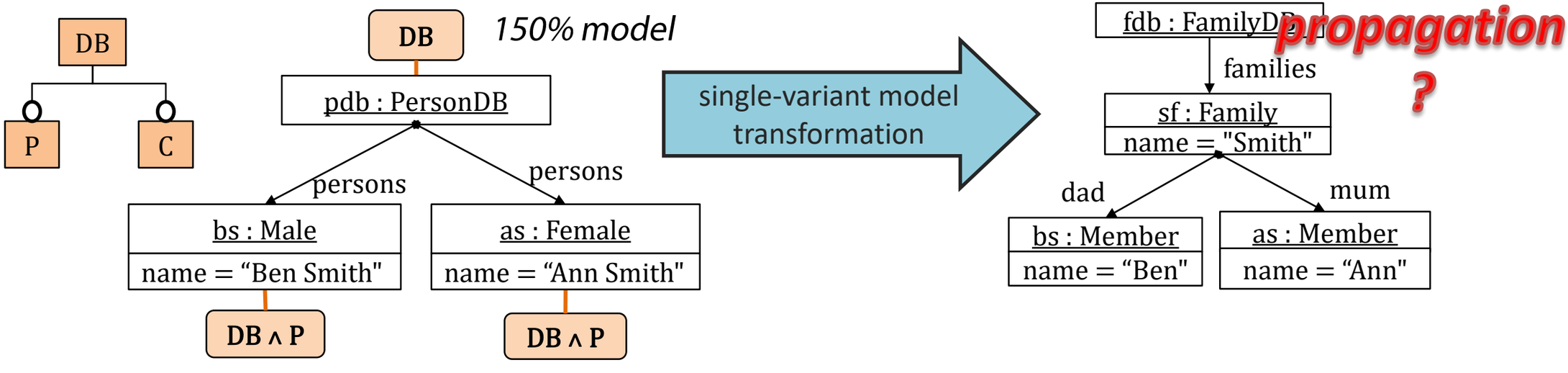
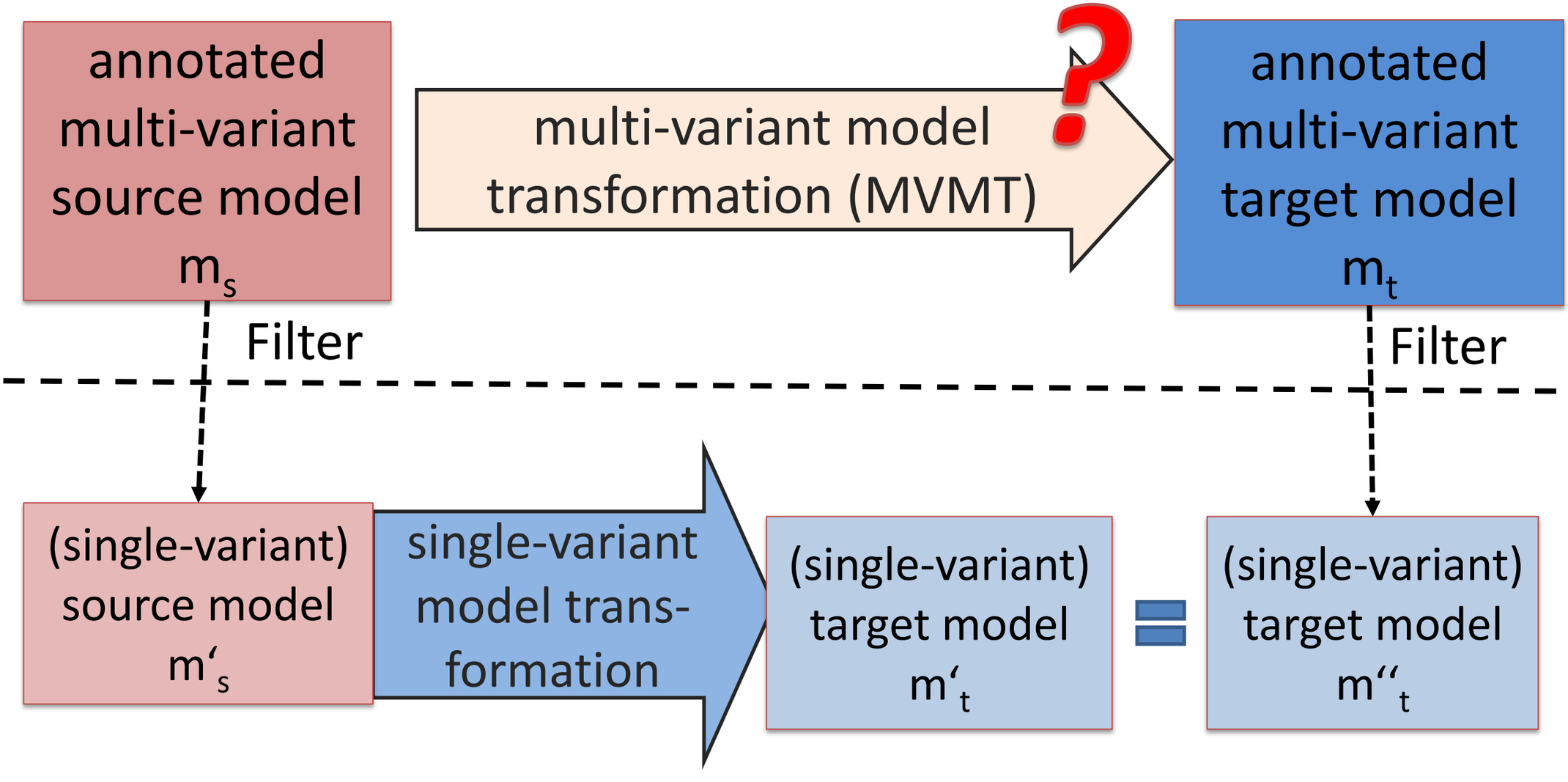


Annotative SPLE

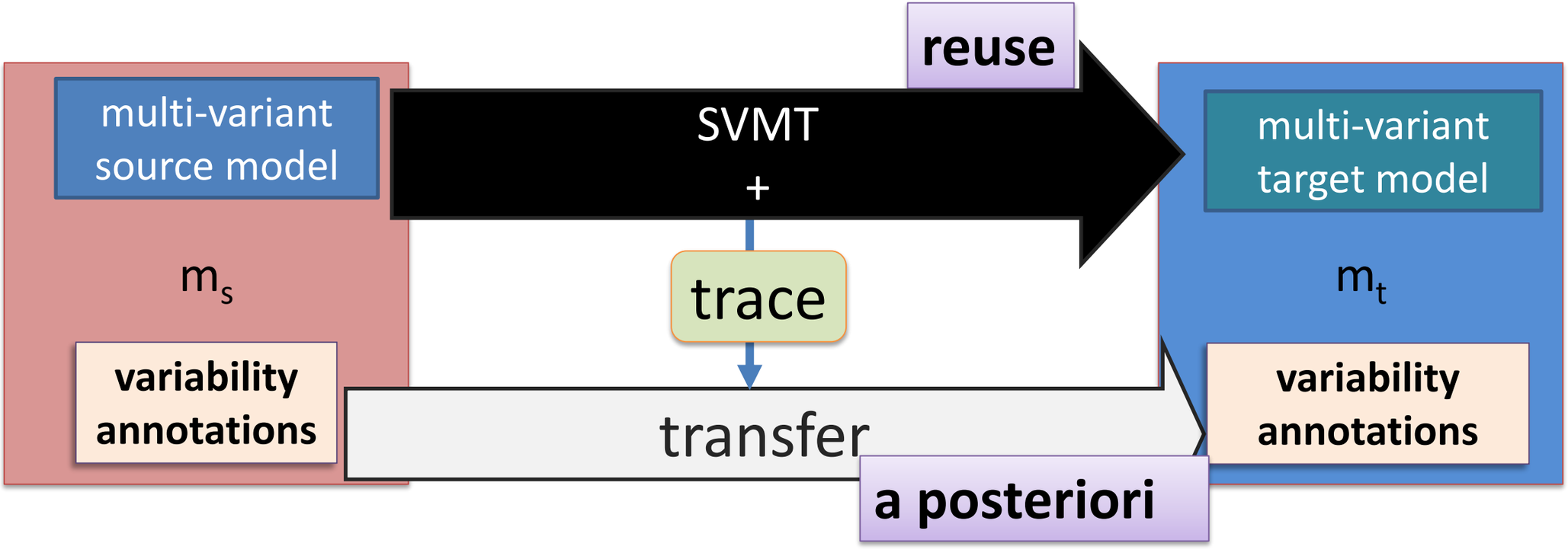
Automatic propagation ?



Evaluation: Commutativity

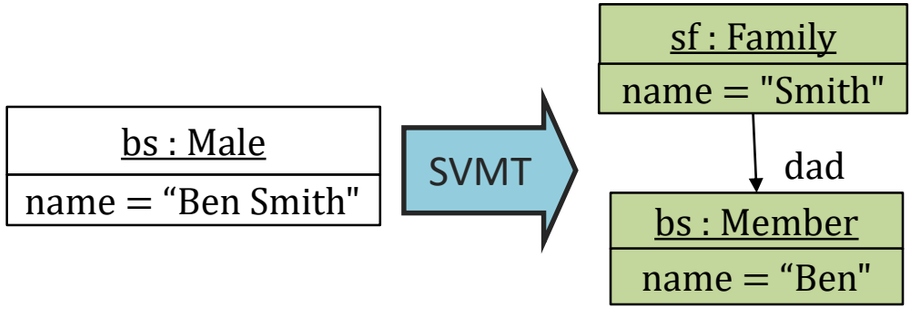


Trace-based MVMT

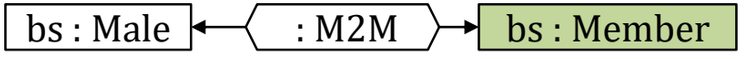


→ no need to rewrite transformation

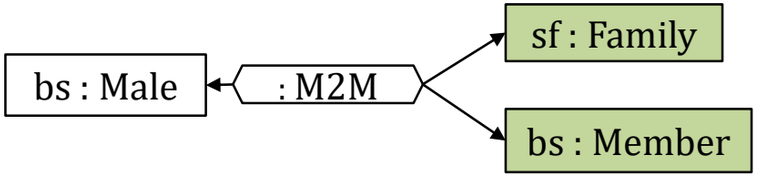
Kind of Traces

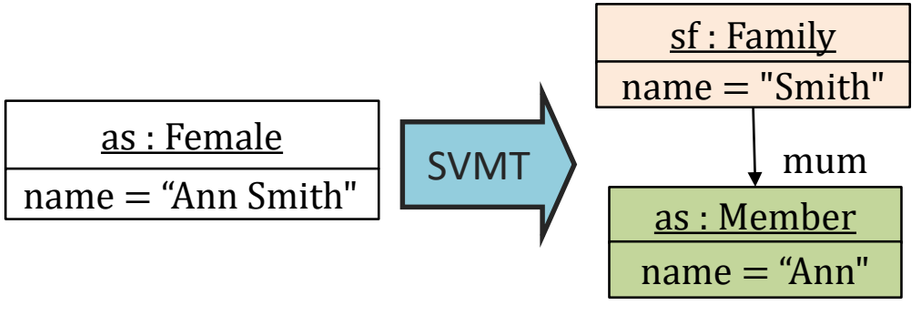


Incomplete Trace



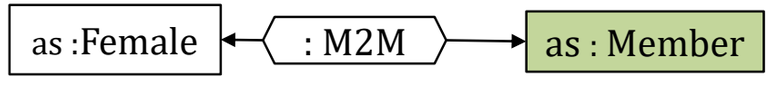
Generation-complete / Complete Trace



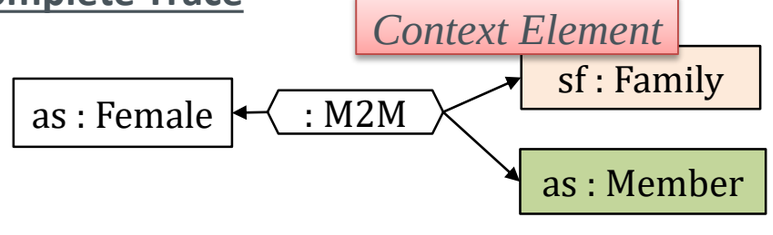


Incomplete Trace

Generation-complete Trace

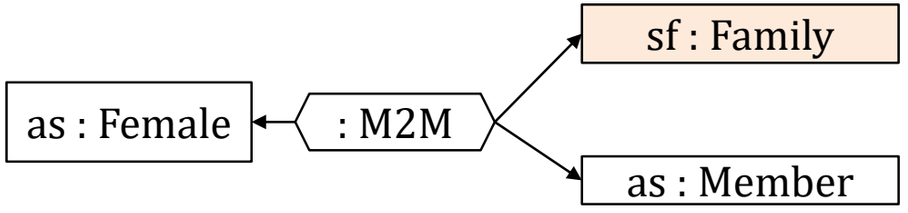


Complete Trace



[Westfechtel and Greiner 18]

Trace-Based Propagation



Propagation based on complete traces

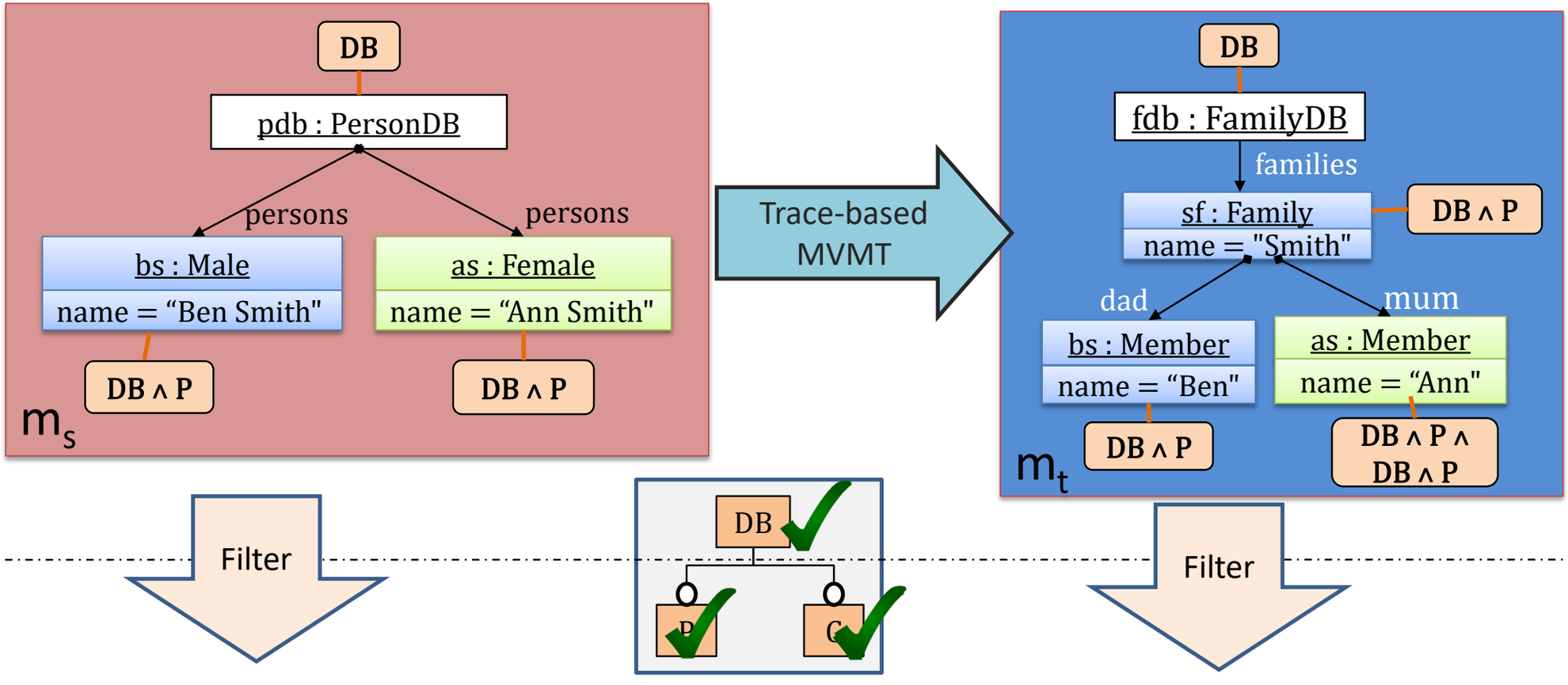
Proved to achieve commutativity

not always,
only if rule applications are:

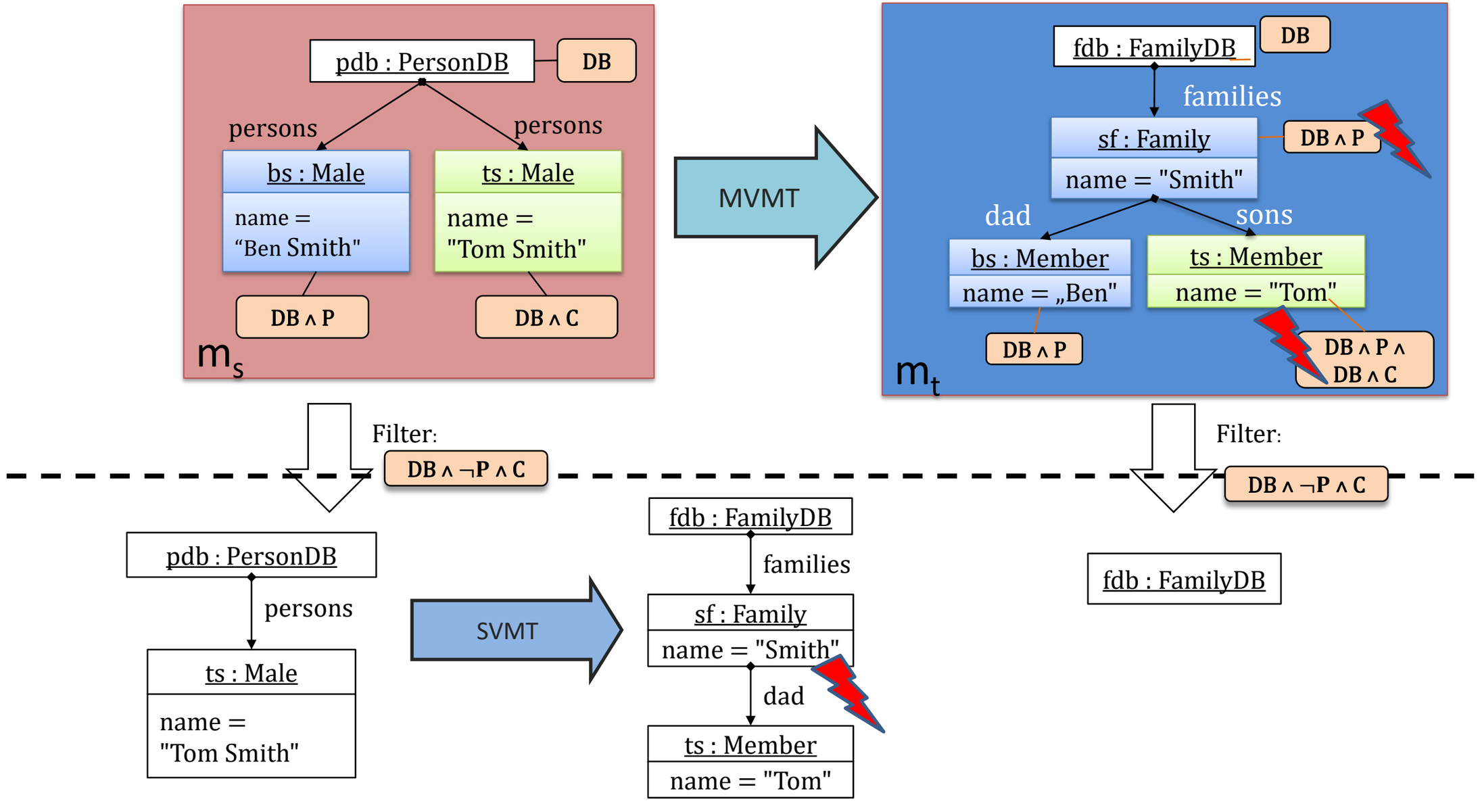
- **Functional:** result determined uniquely by rule match
- **Monotonic:** only adding (target) elements
- **Local:** effect only depends on match
- **Extensible:** rules applicable to same match in any model
- **Confluent:** order of rule application irrelevant

[Westfechtel and Greiner 18]

Commuting example



Weaknesses – Persons to Families



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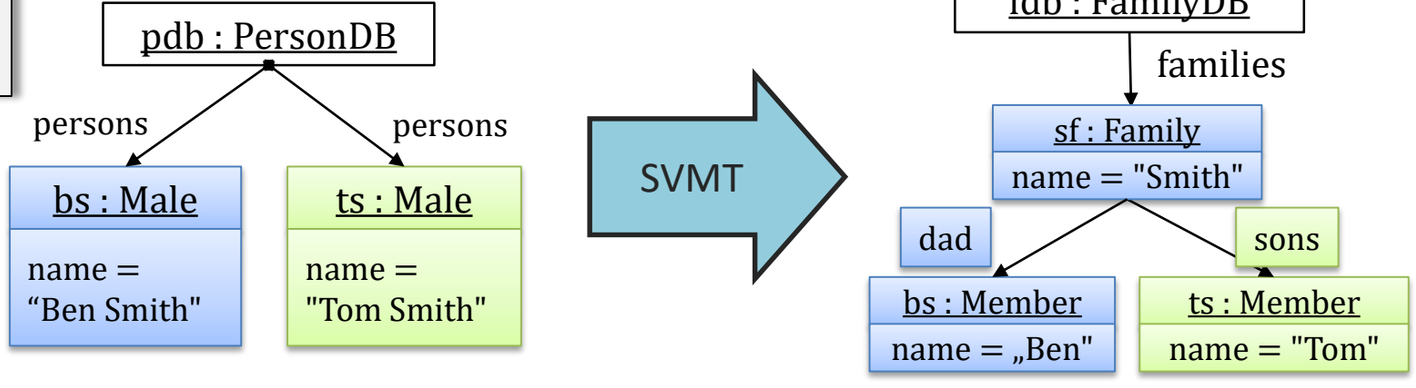
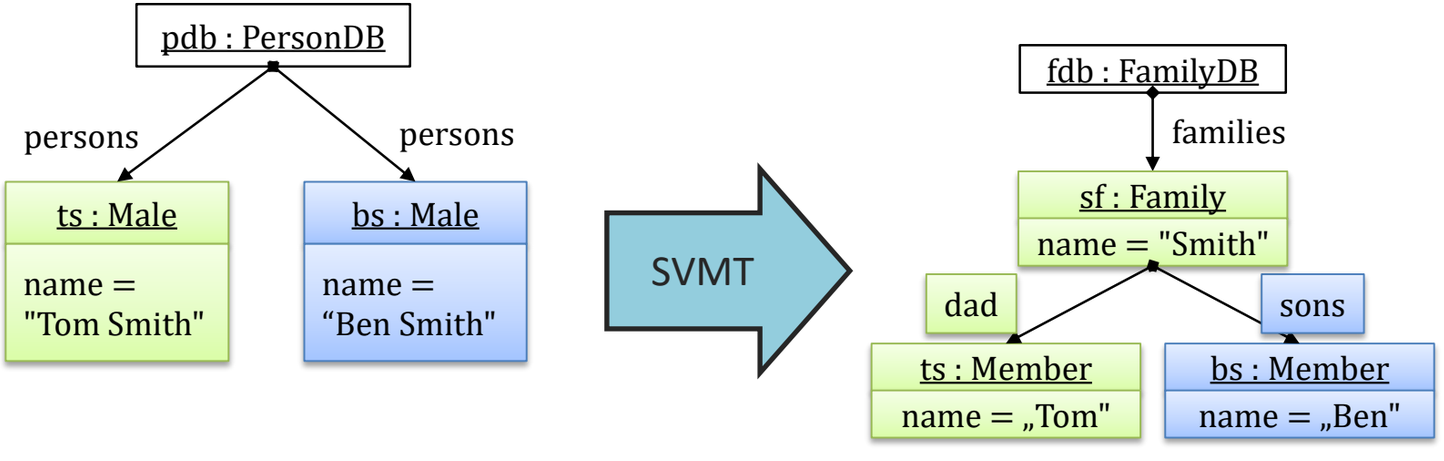
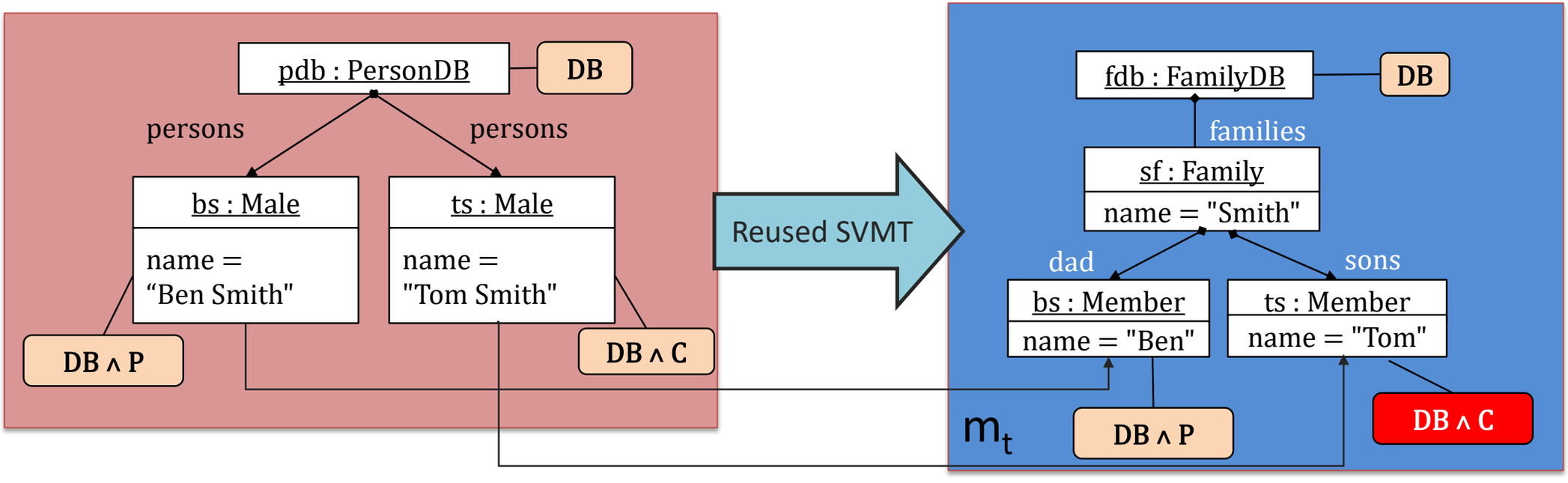


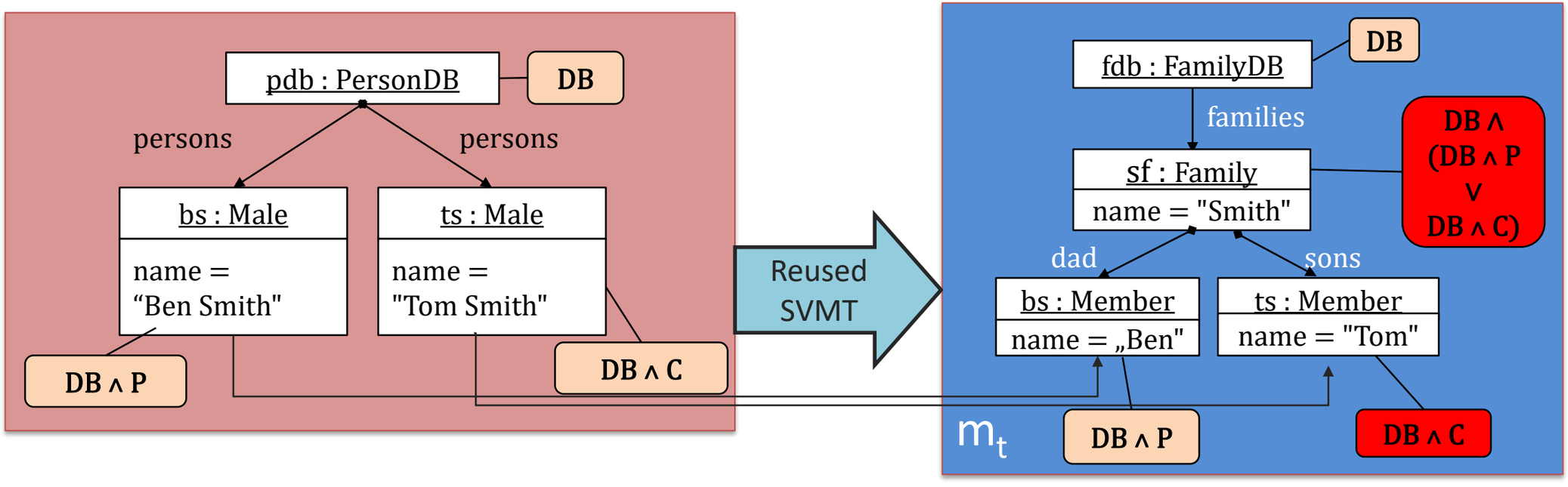


1) Propagate 1:1 correspondences



- Propagation based on 1:1 correspondences
- Without considering context elements
- Annotation of Family?

2) Calculate missing annotations



Calculating missing annotations:

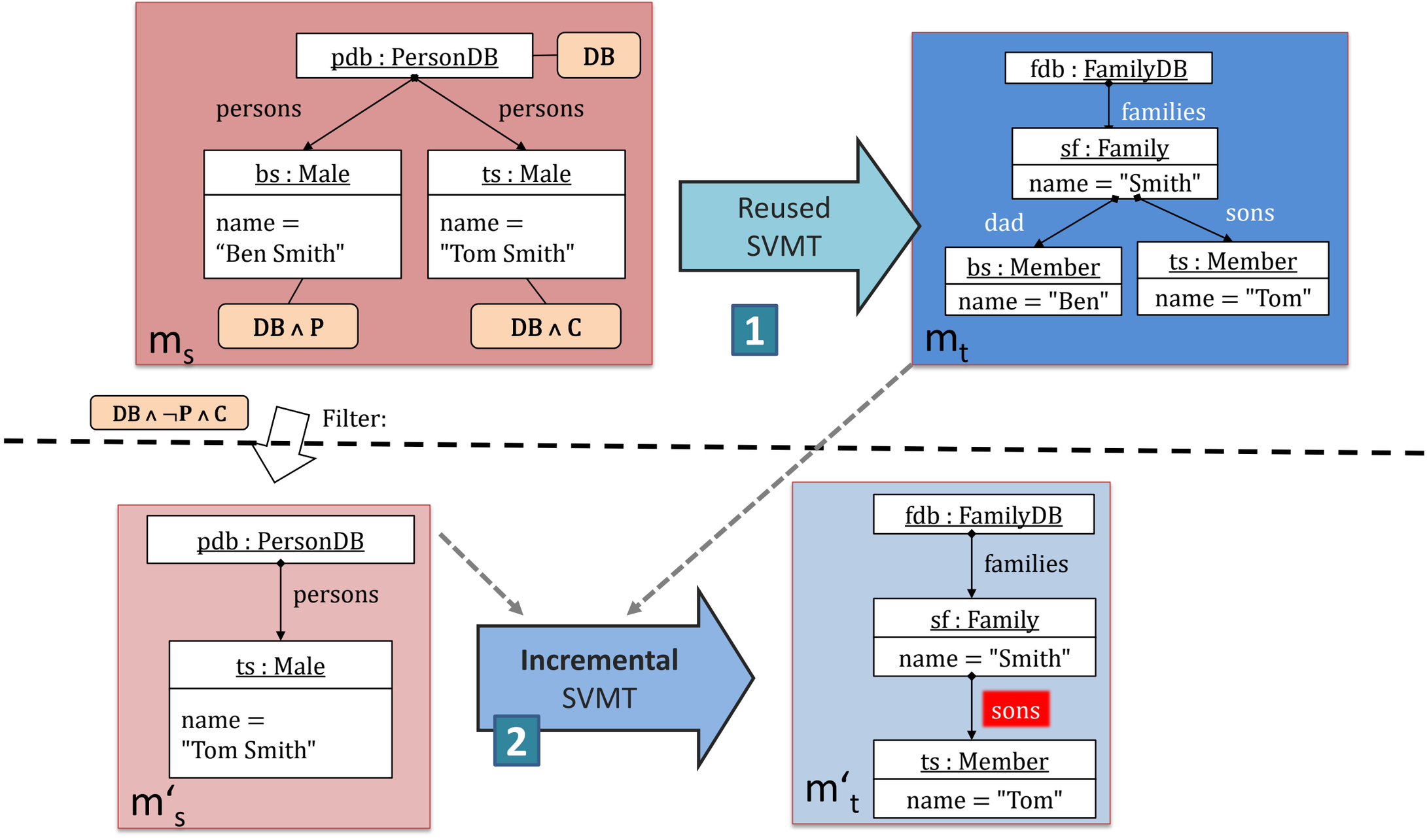
Element visible if

All elements directly necessary for its existence AND

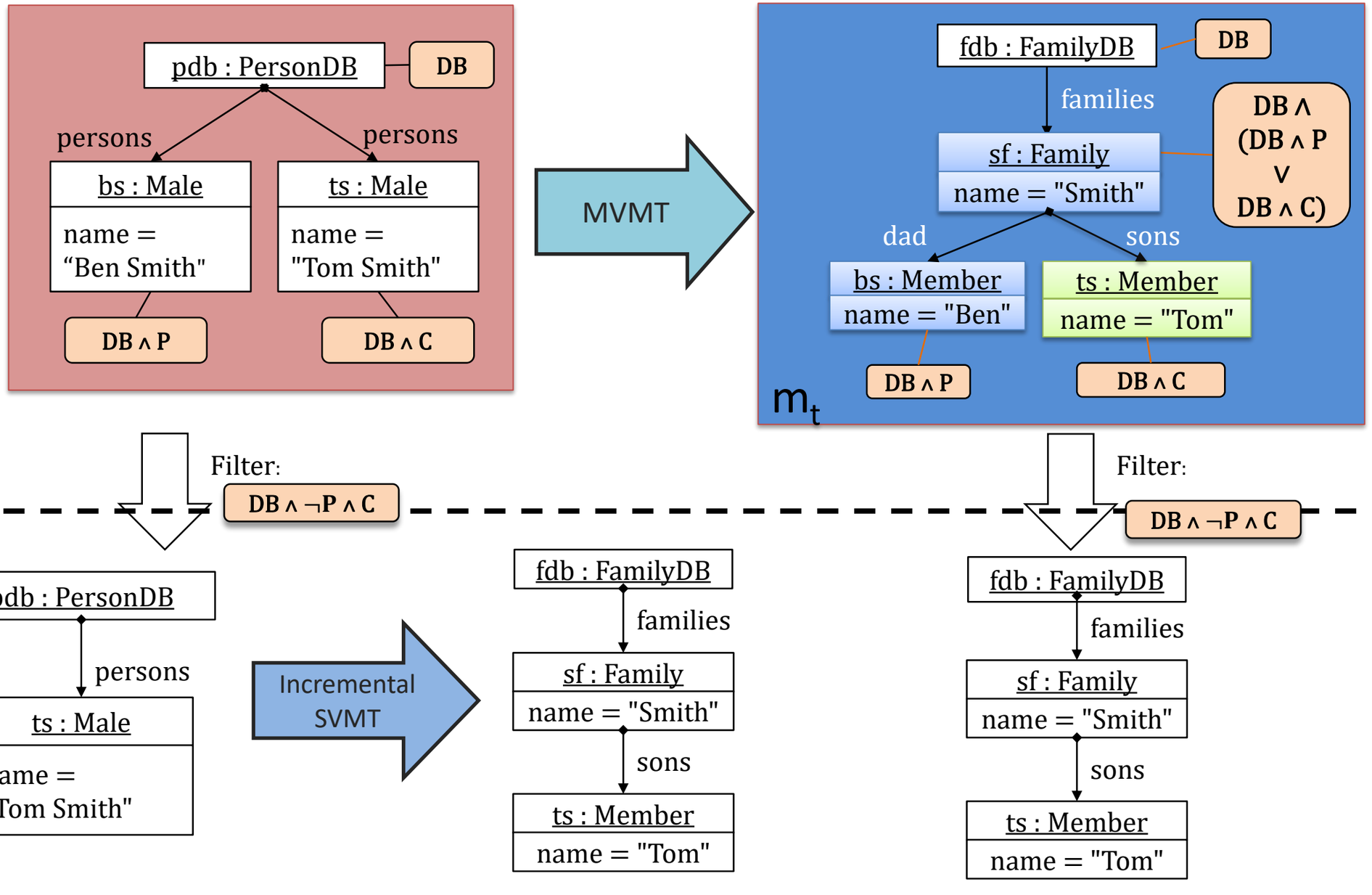
At least ONE of elements needing its existence

are visible

Incremental Transformations



Commutativity



Conclusion

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++ Without analysis of transformation specification:

(correct) propagation of annotations

++ use of most-general information

++ Solving problems with *non-confluent* rules

-- **Open Questions – Post-process calculation:**

- general strategy or heuristic? → proof?

- handling diverging execution paths in

single- and multi-variant context