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Effects of the Background and Experience on the Experts' Judgments through Knowledge Extraction from Accident Reports

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PSAM 12, June 22nd- 27th
Honolulu, Hawaii, USA

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Background & the Problem

Available models for Grounding Assessments are mostly based on experts' opinions

Name	Historical data	Expert opinion	Analytical model	Evidence -based	RCOs	Decision Making Potential
Fujji et al.	√	-	√	-	-	*L*
Macduff	√	-	√	-	-	*L*
Pedersen	√	√	√	-	-	*L*
Amrozowicz	√	√	-	-	Experts	*M*
Fowler et al.	√	√	√	-	-	*L*
DNV	√	√	-	-	Experts	*M/H*
RAMBØLL	√	√	√	-	Experts	*M*
Eide et al.	√	√	√	-	-	*M*
COWI	√	√	√	-	Experts	*L*
Uluscu et al.	√	√	-	-	Experts	*M/H*
van Dorp et al.	√	√	-	-	-	*M/H*
Kristiansen	√	√	-	√	-	*M/H*
Montewka et al.	√	-	√	-	-	*L*

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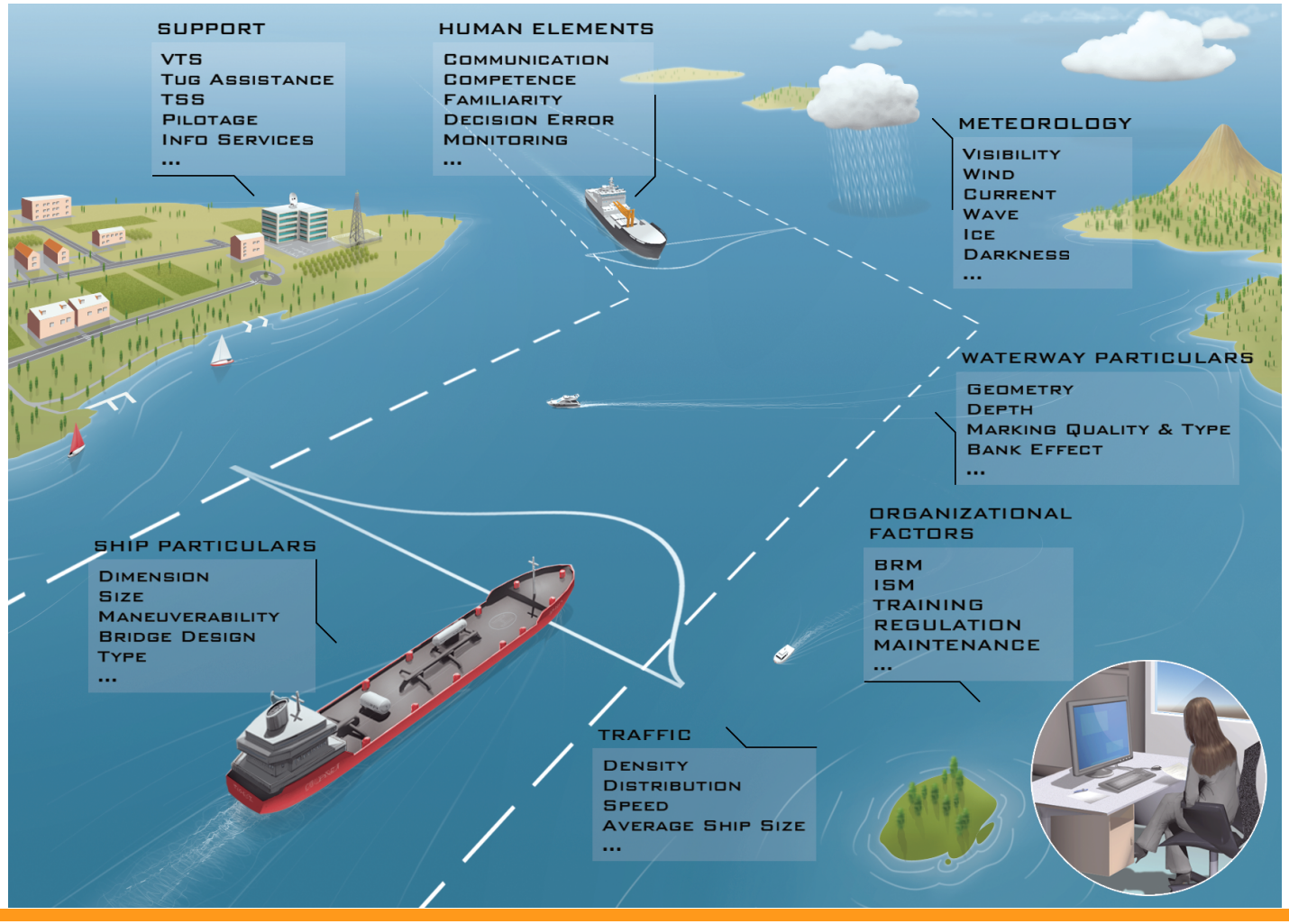
Source: Mazaheri et al. (2013) "Modeling the risk of ship grounding – A literature review from a risk management perspective", WMU Journal of Maritime Affairs , doi: 10.1007/s13437-013-0056-3

"For a systematic and reliable decision making, the RCOs should be the direct result of a knowledge-based modeling process, and the expert opinion should be supplementary to the model's output"

Source: Mazaheri et al. (2013) "Modeling the risk of ship grounding – A literature review from a risk management perspective", WMU Journal of Maritime Affairs , doi: 10.1007/s13437-013-0056-3

There are hundreds of factors that can be considered as affective on an accident



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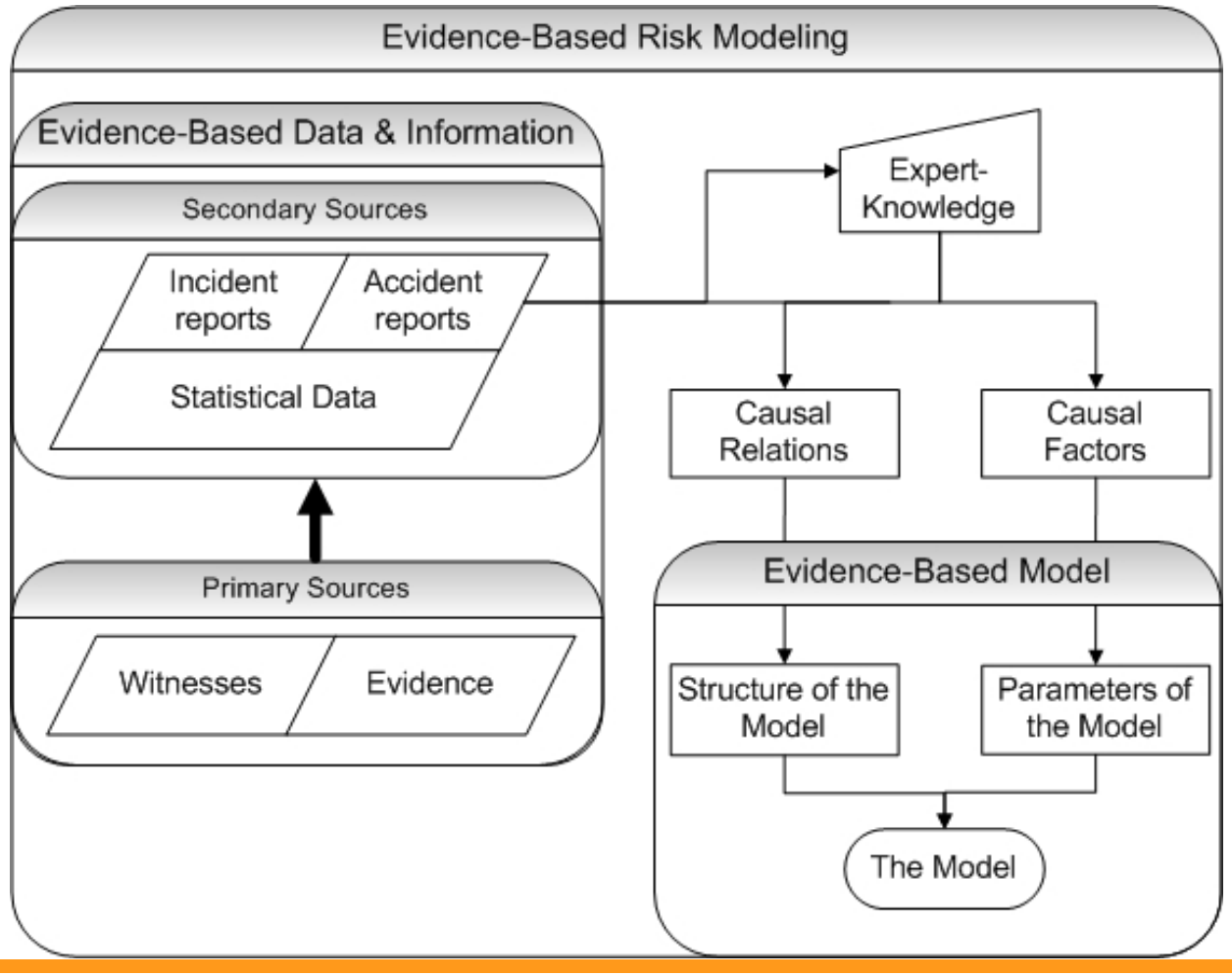
Source: Mazaheri et al. (2014) “Assessing grounding frequency using ship traffic and waterway complexity”, Accepted for publication in the Journal of Navigation

Evidence-Based Modeling is a more proper way for effective risk management



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Source: Mazaheri et al. (2014) "Comparison of the learning algorithms for evidence-based BBN modeling: A case study on ship grounding accidents", Proceedings of the Annual European Safety and Reliability Conference (ESREL), pp. 193-200, September 30th - October 2nd, Amsterdam, the Netherlands; ISBN 978-1-138-00123-7

One main challenge is the possible biases in the reviewing process that comes from the background of the person, who reviews the accident/incident reports

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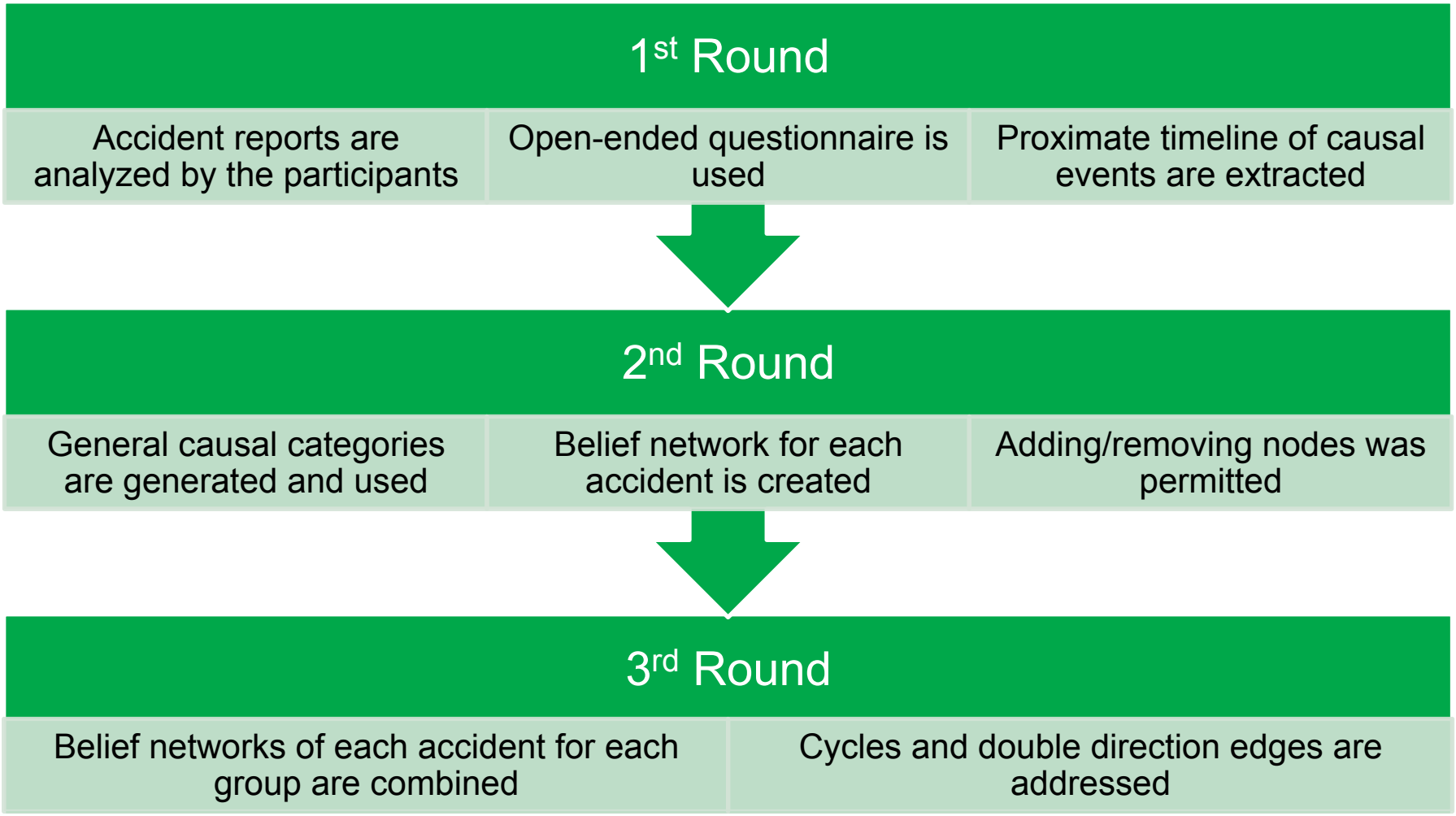
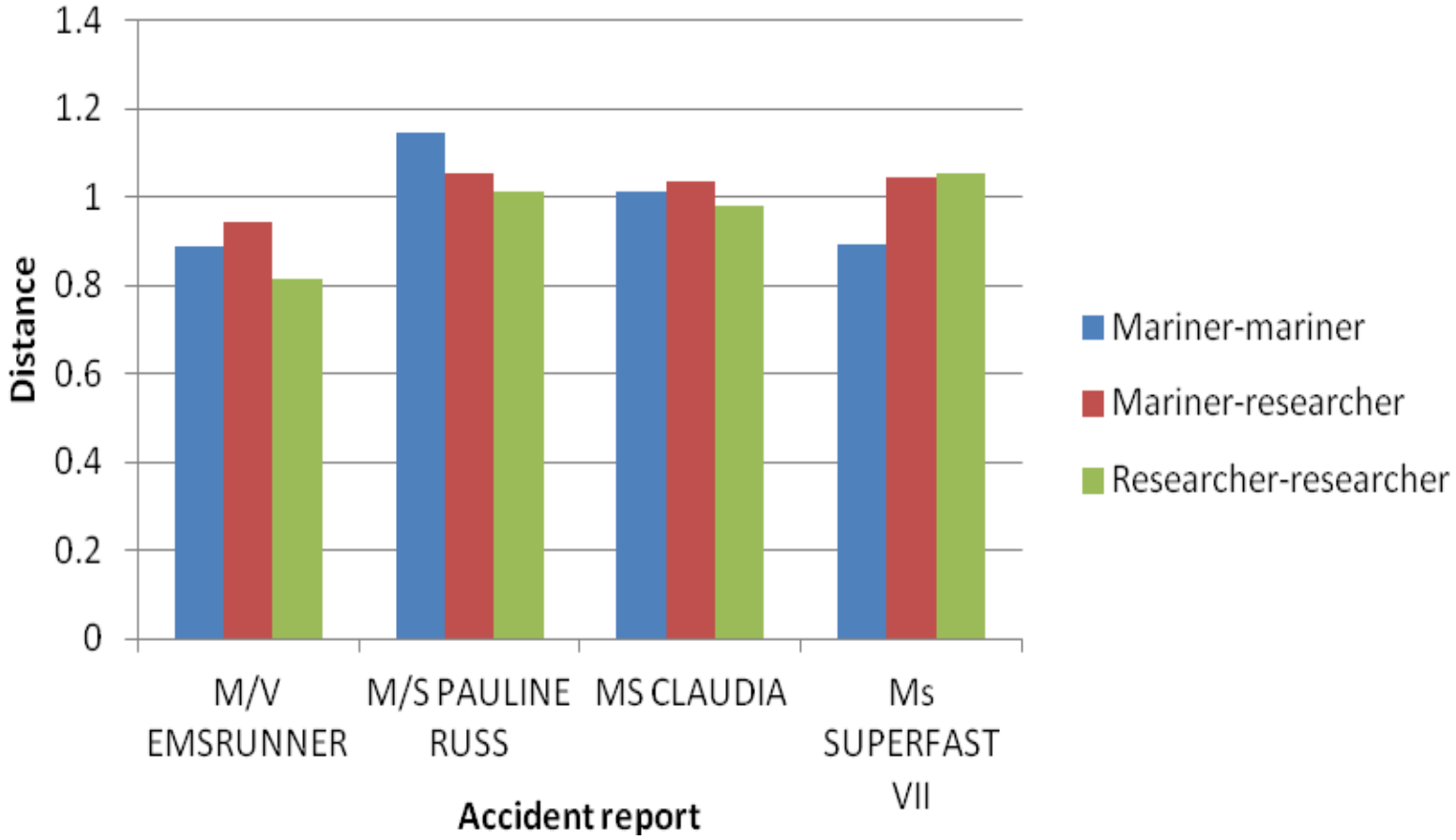
The study

Delphi process used as the method



An alternative distance to Hamming Distance is introduced and used



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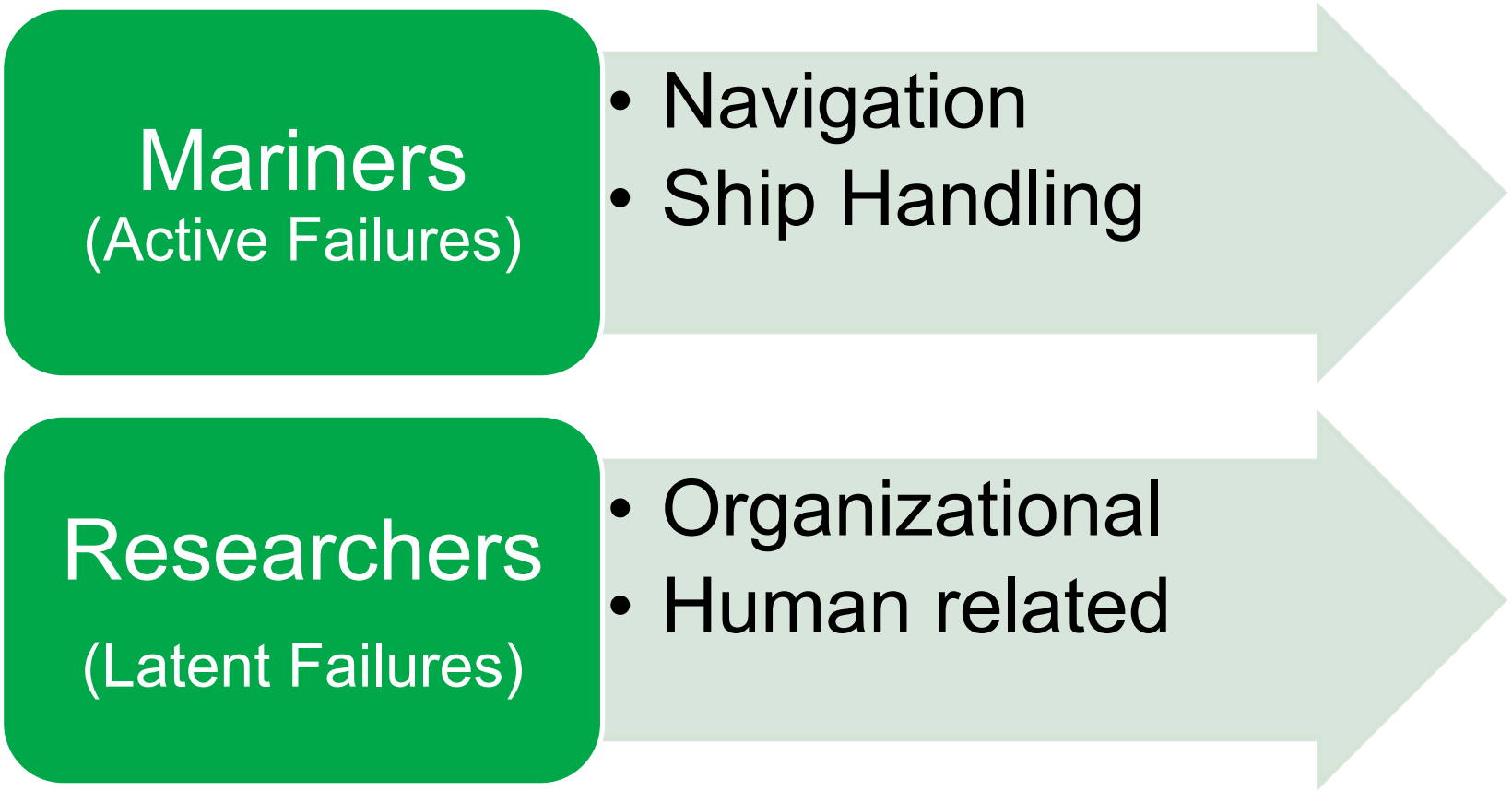
Results

Specific categories were chosen more frequently by each group

Freq. by Mariners	Indifference	Freq. by Researchers
• Route plan • Steering decision • Situational awareness • …	• Environment • Use of Nav. Aids • Faulty practices • …	• Guidelines • Communication • Fatigue • …

The two groups had preferences for recognizing the causes



There were some uncertainties involved

- Small sample size
- Difference in the years of experiences
- Different interpretation of the categories

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