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Safety culture in maritime cargo transport in Norway and Greece: which factors predict unsafe maritime behaviours?

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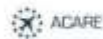


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Background

- Sea transport carries about **90%** of internationally **traded produce**.
- Still seafaring is one of the **most hazardous** occupations.
- Previous studies have **highlighted** the importance of **organisational** safety culture for maritime safety.
- The importance of **sector** or **national** safety culture for safety behaviours has not been widely examined.



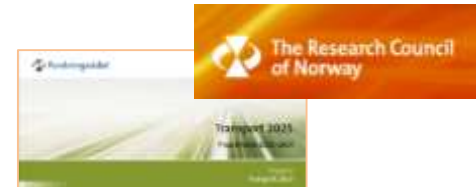
Objective

- To examine the influence of **national** safety culture, **sector** safety culture and **organizational safety culture** on safety **behaviours** among **Greek** and **Norwegian** crewmembers on **cargo** vessels, and to discuss results in light of additional explanatory variables (e.g. working conditions, age, position).



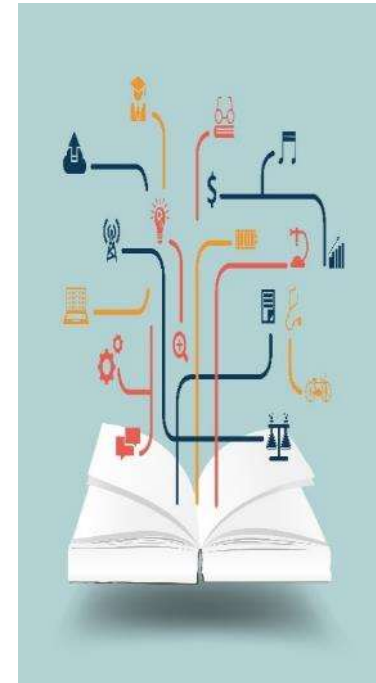
The SafeCulture project

- **SafeCulture** - Safety culture in private and professional transport: examining its influence on behaviours and implications for interventions
 - Aims to explore **safety culture** in **land** and **sea** based, **professional** and **private** transport in **Norway** and **Greece**.
 - Funded under the “Transport 2025” program of the **Norwegian Research Council**.
 - Duration: 36 months (Jan **2016** – Dec **2018**)
 - Partners: **toi** Institute of Transport Economics
Norwegian Centre for Transport Research



Research questions

- How much does **membership in different sociocultural units** influence individual transport safety behaviour in professional and private transport?
- How much does transport safety culture (TSC) influence safety behaviour and outcomes relative to **known risk factors**?
- How can the knowledge on group membership influencing TSC and the relative importance of TSC as a predictor of transport safety behaviour and safety outcomes be used to **increase transport safety**?



Professional maritime transport survey (1)

- **Background variables** (15 questions)
(e.g. gender, age, vessel type, work schedule, etc)
- **Safety performance** (5 questions)
(e.g. respondents' occupational injuries on board, ship accidents, type of ship accidents, safety compromising fatigue and assessment of work place safety level)



Professional maritime transport survey (2)

- **Safety behaviour** (7 questions)

(e.g. How often do you think the following events tend to occur for every 100 working days/nights on board?)

- **Violations/risk acceptance** (4 questions)

(e.g. I violate procedures to get the job done)

- **Working under the influence** (1 question)

(of alcohol or while being hungover)

- **Non-intervention / non-reporting** (2 questions)

(“I refrain from telling risk taking colleagues to work in a safer way, as I find it impolite to intervene”, “I refrain from reporting safety problems and unsafe situations that I experience in my work to the ship management”)



Professional maritime transport survey (3)

- **Working conditions** (4 questions)
(e.g. How often do you think you tend to work more than 16 hours in the course of a 24-hour period for every 100 working days/nights on board?)
- **Organisational safety culture** (11 questions)
(e.g. The shipping company regards safety to be a very important part of all work activities)
- **National safety culture** (10 questions)
(as descriptive norms: “What we think or expect that other seafarers from respondents’ own countries do”
as values: by means of an index measuring “freedom to take risk at sea”)
- **Sector safety culture** (2 questions)
(“Safety is more important than deadlines to our customers”, “Safety is more important than price to our customers”)



Sample characteristics

- **Norwegian** (N=93) and **Greek** (N=99) respondents.
- Norwegians working on **Norwegian vessels** with mainly Norwegian **crews** sailing in Norwegian **waters**. The same principles apply to the **Greek** respondents.
- The majority of respondents were aged **36-55 years old**. The share of seafarers <36 y.o. larger in the Norwegian sample was double than the Greek.
- The majority of **Greek** respondents work on **tankers** (59%), while a large proportion of the **Norwegian** respondents (37%) work on **live fish carriers**.



Results on violation/risk acceptance

- The higher score on the violations/risk acceptance index of respondents between **26-35 years**, indicates their involvement in more violations and risk acceptance.
- The more **demanding working conditions** the respondents experience, the more likely they are to be involved in violations/risk acceptance.
- The more unsafe behaviours the respondents expect from seafarers from their **own country**, the more likely they are to be involved in unsafe behaviours themselves.
- The more respondents' customers **care about safety**, the less violations and risk acceptance the respondents are involved in.
- The higher **organizational** safety culture scores the respondents report, the less unsafe are their behaviours.



Results on working under the influence

- **Working post** contributes significantly and positively, indicating that machine personnel are more likely to work while being under the influence of alcohol, or while being hungover.
- Respondents working under **demanding conditions** are less likely to work while being under the influence of alcohol, or while being hungover.
- Respondents who attribute unsafe maritime behaviours to seafarers from their **own country** are more likely to work while being under the influence of alcohol, or while being hungover.
- Respondents who value **individual freedom to take risks** (at sea) are less likely to work while being under the influence of alcohol, or while being hungover.



Results on non-intervention/non-reporting

- **Working post** contributes significantly and positively, indicating that apprentices and people working in “other” positions are more likely to refrain from intervening against colleagues taking risks and reporting safety problems and unsafe situations to the ship management.
- **Organizational** safety culture is clearly the most important predictor of respondents’ safety behaviour.
- The **higher organizational** safety culture scores the respondents report, the **less likely** they are to **refrain from intervening** against colleagues taking risks and reporting safety problems and unsafe situations to the ship management.



Discussion

- **National** transport safety culture was measured:
 - as **descriptive norms** (what safety behaviours respondents expect from other people in their country) and
 - as **shared values**.
- There are **significant differences** between Norwegian and Greek seafarers' tendency to work under the influence of alcohol, or while being hungover.
- National safety culture, measured as descriptive norms is the **most important predictor** of this behaviour.
- The **false consensus bias** (overestimation of the prevalence of risky behaviour among peers to justify own behavior) may also affect behaviour.



Discussion

- **Focus on safety varies** substantially between **sectors** and **sub-sectors**.
- **Customer focus** on safety is a central aspect of the framework conditions **influencing sector** safety level.
- Therefore, the developed questions aimed specifically to **measure the sectors' focus on safety** (i.e. perceptions of customers' focus on safety versus deadlines and price, whether competition threatens safety in the sector etc).
- The study of national safety culture may be impeded by the **composition** of groups within the **national samples** (Greek tanker crews vs Norwegian live fish carrier crews).



Discussion

- Results indicate that **organizational** safety culture is strongly related to respondents' **tendencies to intervene and report**.
- **National** safety culture was **not** found to **influence** these behaviours.
- Probably relevant **differences** between Norwegian and Greek seafarers are **small**, or **characteristics** of the sample influence the comparison of means between the two national groups.



Discussion

- Results also indicate that **organizational** safety culture influences respondents' **violations/risk acceptance**.
- A relationship between **negative working conditions** and **unsafe** maritime behaviours, especially violations/risk acceptance/risk taking was also found.
- Safety culture at different **analytical levels** influences different types of **unsafe behaviours**.
- Thus, it is important to study safety culture at different analytical levels, in order to fully understand the influence of **culture on safety in transport**.





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