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| **Leeds University**  **Business School** | |  | | | | | | | | |
| **Online Examination Coversheet** | | | | | | | | | | |
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| Module Leader: | **Joshua Weller** | | | | | | | | | |
| Declared Word Count: | 2997 | | | | | | | | | |
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**A1**

The mental model approach is a structured technique used in risk communication to enhance the public’s comprehension and decision-making ability by effectively communicating tailored information addressing gaps and misconceptions in their understanding. Using mental models, individuals could interpret, understand and navigate outcomes in various situations(Johnson-Laird & Byrne, 1991). It facilitates learning by organising and structuring knowledge and hence incorporating new information into the existing mental framework(Craik, 1943). Mental models comprise an individual's presumptions, convictions, and understanding of the functioning of entities, as stated by Doyle and Ford(1998). This may affect a person's understanding, which could lead to smarter decisions with fewer dangers.

Implementing a mental model and communication strategies to mitigate fatigue and significant errors that may occur during nightshifts for employees necessitates an awareness of how risk perception, decision-making, and fatigue affect the mind. Nightshift work disrupts circadian rhythms, leading to fatigue, sleepiness, and cognitive decline. This can increase the risk of errors, accidents, and health problems for employees. This entails the development of focused messages and interventions that effectively target these results.

The first three steps involved in the mental modelling approach to design communication to reduce fatigue and associated errors during employees’ nightshift are:

1. **Expert Model** – A normative model that provides comprehensive insights about what people should be aware of before making informed decisions. This model is based on expert’s vast knowledge, skill sets and experiences, allowing them to make decisions effectively within their area of expertise. To reduce fatigue and errors during nightshifts among employees it is essential to conduct an interdisciplinary literature review using existing literature on the risks due to fatigue in nightshifts and convening an expert panel. Review various guidelines from organizations like NHS, World Health Organisations, that focus on the fatigue caused while working during the night.
2. **Interdisciplinary review** gathers insights and methodologies from psychology, healthcare, IT, and related fields(Johnson-Laird, 1983). Identification of key themes such as the importance of maintaining consistent sleep schedules and sleep environments, workload management with optimal shift rotations and task allocations, and communication strategies highlighting clear guidelines and support systems are crucial for the model. Using these diverse ranges of related sources, the review showcases a comprehensive understanding of the complex factors contributing to fatigue and the effectiveness of different communication interventions in mitigating these issues.
3. **Expert Panel Convening** is a critical step in developing an effective model to address fatigue and errors during nightshifts. It involves gathering diverse experts from relevant fields. To discuss communication strategies, workload management and highlight the factors influencing fatigue, expert meetings are facilitated. They will utilise their expertise to analyse the findings from the literature review, and thus create the expert model. The panel is provided with a summary of critical insights from an interdisciplinary literature review to create a shared knowledge base.

Integrating, findings from literature reviews and expert feedback, the expert model provides valuable tool for organizations seeking to promote employee well-being, safety, and performance.

Influence diagrams are used to represent outcomes from the experts across sectors. These align with expert’s thinking, are also readily understood for peer-reviews, and are fit for decision-making perspective.

**Insights**-

* Various factors as per the experts, that would influence fatigue and potential error due to the nightshift for employees.
* Expert panel feedback will provide recommendations to improve employees’ well-being, safety and performance during the night.
* An influence diagram will help in aligning the feedback from diverse experts and further initiate peer reviews.

1. **The Lay Model** is a descriptive model, that emphasises on what the employees already know and how they are making their decisions based on it.  It includes their beliefs, knowledge, and perception about fatigue and its impact on their health and work performance. Developing a lay model involves gathering information directly from the target audience(nightshift employees) to understand their viewpoints, misconceptions, and informational needs that will help them in making informed decisions.  Firstly, identify the primary factors affecting employees’ decisions using open-ended interviews. This interview can be based on the influence diagram so that it covers relevant topics. Furthermore, it will allow both correct and incorrect beliefs of the employees, thus showcasing their clear intentions. Additionally, a survey can be done using a confirmatory questionnaire, which captures the beliefs of nightshift employees expressed in the unstructured interview and the expert model.

Expected Findings

* Interviews and surveys offer insights into gaps in knowledge regarding fatigue management and employees' experiences, including causes, effects, and current coping strategies.
* Evaluating employees’ experiences with previous interventions for fatigue management will help in developing future fatigue management strategies.

Insights

* Identification of possible misconceptions.
* Highlights the employees’ understanding of fatigue management and provides iterative solutions based on their evolving needs and preferences.

1. **Designing Risk Communication–**This prescriptive approach focuses on what employees further need to know to make more informed decisions. Utilisation of the outputs from interviews, surveys and the analysis of decisions that people make. Comparative analysis of the lay model and expert model can be done to identify knowledge gaps and errors. This will help in determining which incorrect beliefs of the employees need correction and which information gaps need filling. Based on the employee’s insights, identify the key message communicating fatigue risks and their impact on health and performance. To communicate the key message, develop clear and concise materials, which will be formed in simple language, and will be visually engaging. Iteratively test communications for adequacy and accuracy among employees and domain experts.

              Expected Finding

* Identification of specific areas resulting in knowledge gaps among the employees.
* Development of a key message, that will effectively convey the risk of fatigue on health and employee performance.
* Improved decision-making processes among nightshift employees.

**Proposed Design**

* Using digital platforms, posters, webinars etc to inform the employees about incorrect beliefs and how to overcome fatigue risk.
* Stay hydrated and avoid consumption of nicotine and caffeine during late nights.
* Try to reduce the screen time before the shift starts.
* Provide bulletins on sleep hygiene and workload management.
* Providing success stories about employees who successfully overcome work fatigue.

**A-2**

Risk perception refers to the subjective judgements that individuals make regarding the possibility and severity of potential risks. Personal experiences, cultural background, media coverage, and societal factors all have an impact on this complex process. It evaluates how individuals, perceive or react to potential risks associated with certain activities or decisions. For instance, two individuals can interpret same risk in different ways. Risk perception helps in enhancing decision-making processes and behaviours in different domains such as healthcare, environmental management, and policymaking. Slovic outlined factors, like emotions, on risk perception as these responses can cause individuals to overestimate or underestimate the severity of certain threats by altering their behaviour and decision-making processes.

Paul Slovic, an American psychologist renowned for his research on risk perception, emphasized the psychological and emotional factors influencing perceptions. His studies aided in addressing public concerns about risks through innovative strategies. Slovic’s 1987 paper,“Perception of Risk”, explores how people perceive and assess risks. This paper investigates the social factors affecting risk perception and also highlights the inconsistencies between expert and public risk assessments. He utilises the psychometric paradigm, a quantitative method used to study how people perceive various risks. This approach has identified key factors that influence risk perception, such as dread, familiarity, and controllability. Slovic highlighted the “affect heuristic” by demonstrating how emotions can impact judgements about risks and benefits. Two factors contribute to people’s perception of risk:

1. “Dread” is characterised by strong emotional responses like fear and anxiety towards perceived threats due to potential fatal, catastrophic and uncontrollable outcomes. Dread risk influences how people perceive and evaluate risks. When applied on genetically edited foods(GE) such as tomatoes with extended shelf life, or hypoallergenic peanuts, concerns about unknown potential health risks, environmental effect and ethical implications associated with genetic modification emerges dread. For instance, people might fear that introducing hypoallergenic peanuts, could cause new types of food allergies, that could result in long-term health issues which are not yet explored, or it could have negative impact on environment, by unintentionally affecting non-targeted species such as insects, plants etc. It may also raise ethical concerns about modified GE due to unclear ingredients profile or manufacturing process, thus causing heightened fear and anxiety among people.
2. “Unknown Risk”

Unknown refers to the lack of perceived knowledge or understanding surrounding the risks caused by a particular hazard or technology. Slovic characterised “unknown risk” at its high end by risks perceived as new, uncontrollable, unfamiliar, and with harm that occurs after a delay.

For GE foods, unknown factors may arise from gaps in understanding the complex genetic modifications, as the science behind it is not fully understood by general public, thus invoking fears about unexpected outcome. The lack of knowledge about GE may cause unfamiliarity among individuals leading to rejection and mistrust. Potential delay in unintended outcomes surrounding people’s safety, could contribute to uncertainty as individuals may feel uneasy or skeptical about it. People tend to consider it as high risk and low benefit due to uncertainty caused by new and niche technology while manufacturing GE food.

**People’s v/s Experts perception of assessing Risk**

Public perception of risk for GE food is often affected by emotions such as fear, anxiety, skepticisms and mistrust. People tend to focus more on potential negative impacts considering health and environmental harm caused by mutated food without studying the scientific evidence behind it. Uncertainty regarding long-term effects of GE food contributes to public’s perception of unreliability. They also tend to get influenced by others perspective even if there is limited knowledge, causing “bandwagon effect”. Some people consider the decision by the government or regulatory agency as inadequate or influenced by industry interests, causing concerns about the food safety. Due to unknown effects, people tend to overshadow benefits and focus more on its potential risk, thereby exhibiting risk aversion.

While experts’ perception of risk is based solely on the scientific research and analysis of the evidence because they perform rigorous testing and inspect all potential outcomes of gene modification in food. They trust the approving agencies and reply on their evaluation to assess potential risk. They compare the potential risks and benefits involved in affecting human health and the environment. Experts also acknowledge the uncertainties by approaching them using available evidence and targeting areas that needs more research.

**Perceived risk and Benefit**

The relationship between risk and benefit illustrates how an individual perceives and reacts to risks. Individuals tend to accept risk when there is significant benefit associated with it. Perceived risk and benefit showcase an inverse relationship on decision-making processes. Individuals make their judgement based on what they think, and how they feel about the activity. This relationship often gets affected by factors like affect heuristic. Affect Heuristic refers to mental shortcuts where individuals make their decisions based on emotional responses to monitor risk and benefits. The inverse relationship between perceived risks and benefits increases under time pressure, when there is less opportunity for analytical thinking(Finucane *et al*.,2000).

When negative affect dominates, perceived risks are high and benefits are low. While, when positive affect is strong, benefits are high and risks are low.

When individuals perceive negative emotions about GE foods, such as fear or anxiety, they tend to perceive higher risks. Unknown long-term health effects, potential environmental impact, and ethical issues elevate this perception of risk and lessen the benefits. For instance, fears that GE tomatoes might have unforeseen health results or that hypoallergenic peanuts could affect the environment can dominate potential benefits.

Alternatively, when individuals experience positive emotions like belief or attitude, they are more likely to perceive significant benefits from GE foods. The potential advantages, such as extended shelf life reducing food waste or hypoallergenic peanuts preventing allergic reactions, become more evident in their evaluation.

Understanding risk perception of public is essential for crafting customised communications that highlight specific concerns provided by the audience. This enhances communication relevance by building trust and engagement and identifies potential knowledge gaps and errors. Addressing this in brochures will provide effective risk communication to the public.

**B2**

**Introduction**Smoking in the workplace affects the health of employees as well as reduces productivity, thereby increasing healthcare costs for employers. Despite the information available regarding this risk, many people continue to smoke, marking the need for interventions to promote quitting.  
  
**Research Question**  
Does offering cash incentives to employees to quit smoking affect their smoking behaviours over 12 months?

This research question highlights the significant health issue of smoking, which is major cause of preventable diseases and healthcare costs. The study can provide insights about improving workplace health, lowering absent rate of employees and enhancing productivity by analysing whether cash incentives can reduce smoking behaviours among employees over 12 months.

Furthermore, the analysis can help in understanding the impact of incentives on employers, by designing cost-effective wellness programs and supporting public health policies designed to modify behaviour over-time. Therefore, this research could ultimately improve both economic and personal health.

**Independent variables** can be manipulated or controlled by the researcher in an experiment to observe an impact on dependent variable and do not affect the outcome. It cannot be influenced by other variables.

The independent variable in this study is cash incentive provided for reducing smoking behaviour which is further divided into two groups, a control group that gets no cash incentive, and an experimental group that receives cash incentives for quitting smoking for 6 months(£400) or 12 months(£700). This will help in creating better strategies to help people quit smoking especially at workplaces.

**Dependent variables** are measured or observed to determine the effects of the independent variables. In this study, employee smoking behaviour acts as the dependent variable, which will be regulated by both self-reports smoking status and biochemical verification methodologies. Self-reporting is a common method used for assessing smoking behaviour in research studies (Heatherton et al., 1991). Biochemical verification, may include detecting cotinine levels in samples of urine, blood or saliva(Bennewitz et al., 2002). This will provide an insights about our results and check its reliability by providing a clear picture of whether the cash incentives actually affect people quit smoking.

**Methodology**

Study Design

Random Controlled Trial (RCT) is robust experimental approach that evaluates interventions by assigning participants into different groups randomly. One set receives the intervention, while other group serves as control.

In this study, employees will be selected through company-wide announcements and advertisements, completing self-report surveys to evaluate interest and smoking status. The participants will be randomly assigned to different groups one group receiving interventions while the group acting as control(without receiving interventions). Throughout the intervention, participants can monitor their progress and the necessary support to quit smoking. Follow-up assessments at 6 and 12 months will consist of self-report surveys and biochemical verification for validation, ensuring comprehensive data collection. The dataset collected may be considered appropriate as it consisted of employees willing to quit smoking which positions with our objective. The samples representativeness will depend on the comparison of employee demographics and overall smokers in workplace.

This approach will ensure any observed changes in rate of smoking can be assigned to the intervention, providing reliable evidence on its effectiveness and efficiency.

The random separation approach will minimize bias ensuring that observed differences are due to the intervention. Control groups will help researchers in assessing the true effect of intervention. Determining whether changes are continued over time, follow-ups will highlight long-term impact. Overall, RCT design ensures accuracy and credibility of the results by increasing the usefulness of the findings.

**Individual difference variable** that might impact the effectiveness of the cash incentive program is “motivation of behaviour change”. It refers to an individual's motivation to succeed in specific situations or task such as quitting smoking(Bandura, 1977).

Individuals with high desire are more likely to believe in their ability to quit smoking and may be more motivated to overcome through challenges.

When an employee understands the potential risks from smoking and perceives it as high risk and low benefit, he tends to showcase motivation and will power, thereby quitting smoking. While an unmotivated person will not consider the repercussions of frequent smoking and due to the addiction of nicotine will not even try to quit smoking.

**Impact on Results:**

Participants with higher self-efficacy may positively respond to the cash incentive program and be more motivated to quit smoking. Highly motivated individuals may engage more with the program and effectively utilise the resources by following guidelines, while those with low motivation may not fully engage in the program and may drop out early.

Motivated individuals may view the cash incentive as a reward for their hard work and may be very confident in successfully quitting smoking, while individuals with lower self-motivation may struggle to quit smoking, irrespective of the incentive offered. Their weak internal drive may lead to limited change following higher risk of relapse as they may not want to work hard and may perceive quitting too difficult.

**Communication Strategy:**

1. Highlight short-term benefits by focusing on cash incentives, thus serving as a powerful motivator.
2. Encourage setting smaller and manageable targets rather than focusing on the entire quitting duration like reducing the number of cigarettes smoked per day or increasing the duration between smoking sessions can boost their confidence.
3. Share success stories of individuals who were able to quit smoking with the help of the cash incentive program. These stories can motivate employees and demonstrate that quitting smoking is achievable, even for those with lower self-efficacy.
4. Offer continuous support, through counselling, regular check-ins and support groups to help build their motivation to quit smoking.
5. Address potential barriers to quitting smoking, such as withdrawal symptoms, stress and cravings. Provide coping mechanisms to help individuals overcome these barriers and stay motivated to quit.

In conclusion, performing an RCT can provide valuable insights into the effectiveness of offering cash incentives for quitting smoking among employees. Considering individual differences such as self-motivation and implementing communication strategies can enhance the program's effectiveness and support employees in their quit journey. Implementing communication tactics and taking individual variations like self-motivation into account can help employees quit and increase the program's efficacy.

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