



### Overview Research Program



#### **Program Objective**

to understand chronotypes in the Philippine population and how it may be influenced by certain characteristics and shift work in a contact center work setting

#### Two (2) component projects

Project 1: chronotypes of Filipinos

Project 2: chronotypes of Filipino contact center workers and adjustment to shift work

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## Keeping time, every day

Solar time

Social time

**Biological time** 









## I. Human Chronobiology Which chronotype are you?

- "larks" and "owls"
- "morningness" and "eveningness"
- based on middlemost time of sleep (MSF): evaluated using the Munich Chronotype Questionnaire (MCTQ)
  - Philippine Munich Chronotype Questionnaire (PhilMCTQ)
  - Early type: extreme, moderate, slight
  - Normal type
  - Late type: slight, moderate, extreme













## **II. Daily routines**

#### What influences our daily routines?

- zeitgebers [Ger. "time givers"]
  - · environmental temperature and light-dark cycle\*
  - · man-made time givers
    - wristwatch time
    - · culture: meal times, "siesta"
    - contemporary technology & life practices





## III. Shift work

Characteristics of shift work routines Adapted from Kantermann 2008\*

| Aspect                | Definition/Example   |  |
|-----------------------|--|--|
| Shift type            | morning, mid, night shift  |  |
| Change-over time      | the starting hours of shift work schedules                                 |  |
| Direction of rotation | clockwise shift rotation, counterclockwise, fixed or permanent night shift |  |
| Frequency of rotation | shift schedule changes every week or every month                           |  |
| Length of shift       | 8-hour, 12-hour shifts   |  |

\*as illustrated in Shift work research in the Philippines: current state and future directions (Lozano-Kühne et al, Philippine Science Letters, 2012)



## Comparison: local and foreign shift work studies

*Shift work research in the Philippines: current state and future directions* (Lozano-Kühne et al, Philippine Science Letters, 2012)

|                                     | Local Studies  | Foreign Studies*  |
|-------------------------------------|--|---|
| Study design                        | Case Studies,<br>Cross-sectional                         | Cross-sectional, Retrospective,<br>Prospective, Simulated Studies (non-<br>real life situation or lab setting);<br>Interventional (pharmacological) |
| Study subjects                      | Nurses, call center employees and others (manufacturing) | Shift workers from various industries   |
| Methods of data collection          | Questionnaire, Interviews                                | Questionnaire, Interviews,<br>Laboratory Exams (e.g. melatonin<br>level)  |
| Factors<br>investigated<br>(unique) | Reproductive health, Sexual activities                   | CVD, cancer and other chronic<br>diseases, circadian rhythm,<br>chronotypes, light exposure,<br>seasonal effects                                    |

\*Other studies on shift work conducted outside the Philippines

# Gaps in knowledge, issues, and research approaches

#### Issues

- · different shift schedules
- · "healthy worker effect"
- · measurement of long term effects and circadian phase

#### **Untapped research areas**

- · chronotypes
- · circadian rhythm disturbance
- light
- · speech
- · actual physical workload and time pressure
- · exposure to heat, dust or other hazards
- · dermatological problems (?)
- genetic: human clock genes PER1 and PER2
- Others: nurse-to-patient ratios, family life, social and psychological problems, coping mechanisms, quality of sleep

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Chronobiology and shift work research development of chronotype tools for specific populations (i.e. non-shift worker, shift worker in particular industries) ✓ a chronotype database yielding reference values for chronotypes, sleep, and key health indicators; and variety of chronobiology-oriented projects **Field Studies** Databases PhilSHIFT Framework (European predictors ClockWORK Initiative) Laboratory Modelling experiments

# Examples: applications of chronobiology in shift work

- Aligning work and internal time in shift workers (Vetter et al, 2015, Current Biology 25, 1-5)
- Sleep-wake behavior of shift workers: case of 12-H, fast rotating shift routine (Fischer et al, 2016, Chronobiology International, 33(1): 98-107)
- A Philippine study: duty schedule of medical residents, chronotype\*, attention, alertness, and reaction time [(Abstract on HERDIN Database) Lim-Khoo et al, 2016. Effect of duty schedule on emergency medicine and internal medicine residents in training with early, intermediate, and late chronotypes on attention, alertness, and reaction time. Journal of the Philippine Medical Association, 94(1); 122-140]





