

# UbiComp '11

## Exploring User Experiences of Active Workstations

### A Case Study of Under Desk Elliptical Trainers

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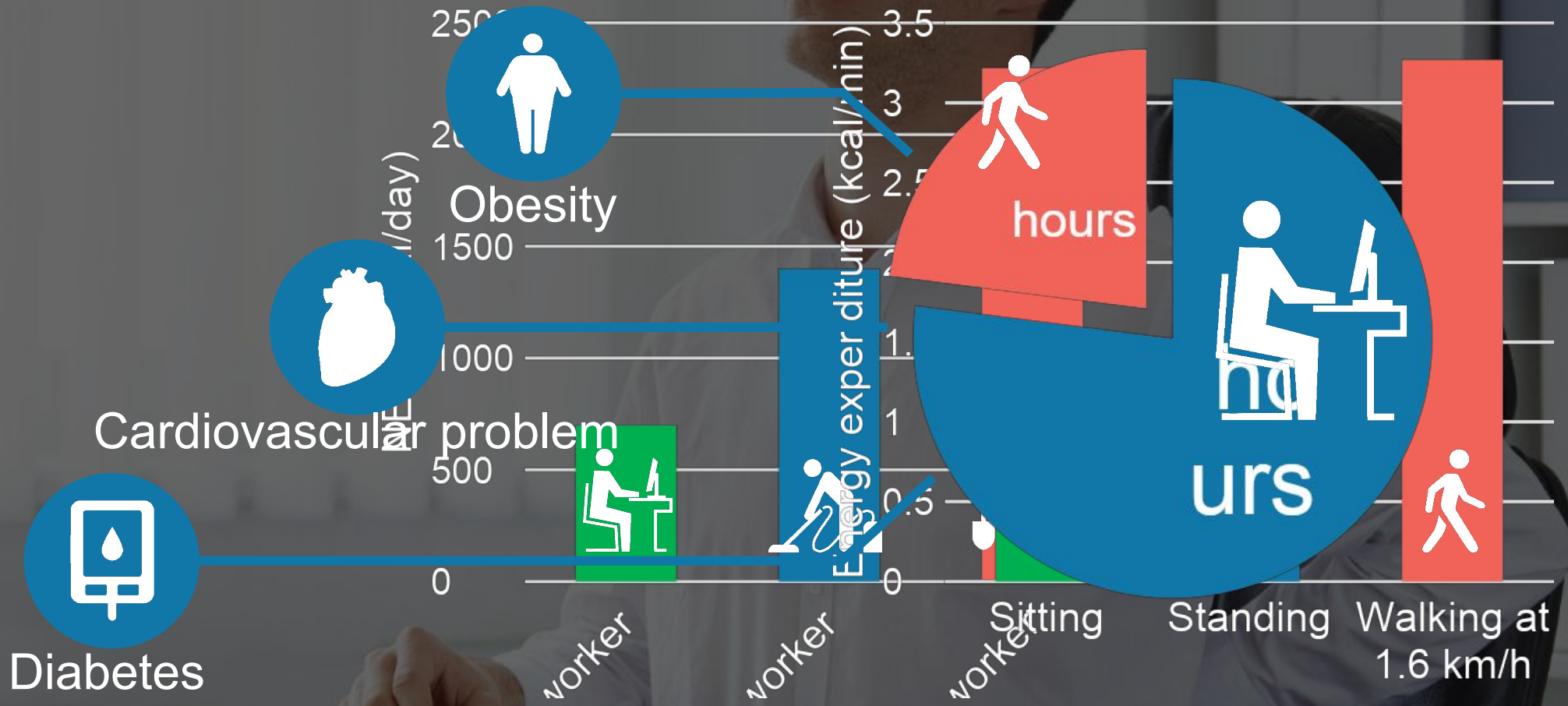
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# Physically Active Life



# Sedentary Work





# Active Workstation

A person wearing a dark suit and brown loafers is using a silver and black elliptical trainer. The person's feet are on the pedals of the machine. In the foreground, a hand is typing on a black keyboard. The background is a blurred office setting with a laptop and a window. A semi-transparent dark grey box with rounded corners is overlaid on the right side of the image, containing white text.

What is the importance of  
**an elliptical  
trainer  
on task  
performance?**

A woman with long blonde hair, wearing a dark blue long-sleeved shirt and black pants, is sitting in a grey office chair at a desk. She is using a desk-mounted elliptical trainer. Her feet are on the pedals of the machine. In front of her is a laptop computer. The desk is cluttered with various office supplies like pens, a calculator, and a pair of scissors. The background is slightly blurred, showing more of the office environment.

**How and why**  
do office workers use  
**elliptical trainers at**  
**work?**



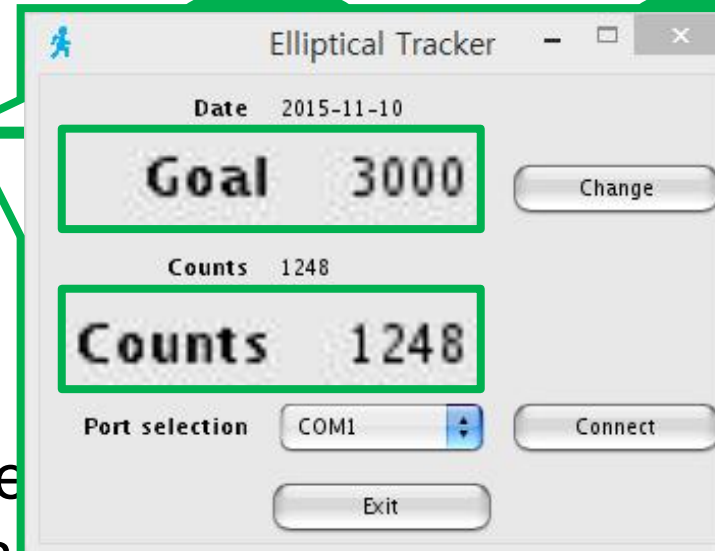
How do office workers  
**feel about**  
the use of elliptical trainers at  
work?

# Study Procedure

13 Participants (age: 24-33)  
/ 8.7 hours of sedentary work

4-week deployment with  
weekly surveys / usage tracking

1:1 interviews



Performance measurement  
of simulated office tasks

Measurements  
of simulated office tasks



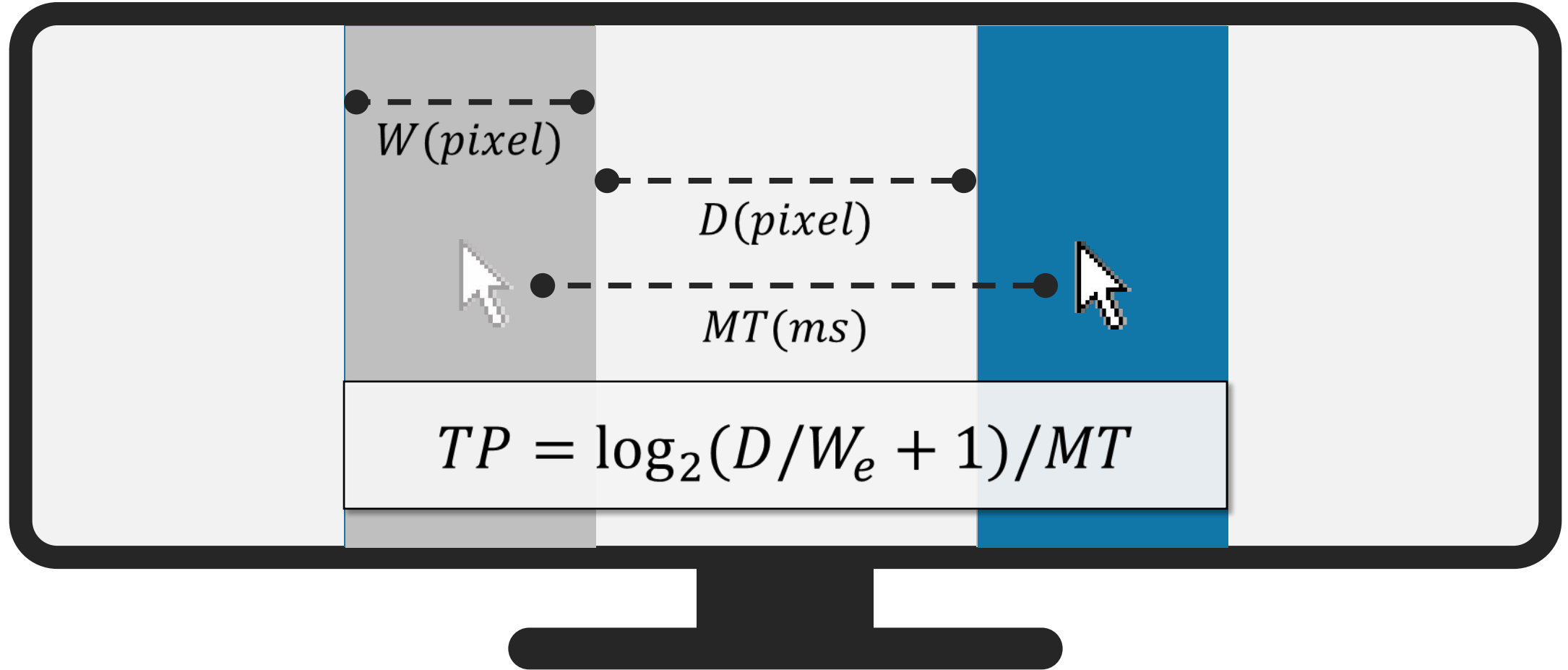
# Influence on

How does the use of an elliptical  
trainer  
**work**  
influence on the performance of office  
tasks?

Task Descriptions  
Experiment Setup  
Performance Comparison

# Mous

# Pointing



# Keyboard Typing

## The Gettysburg Address

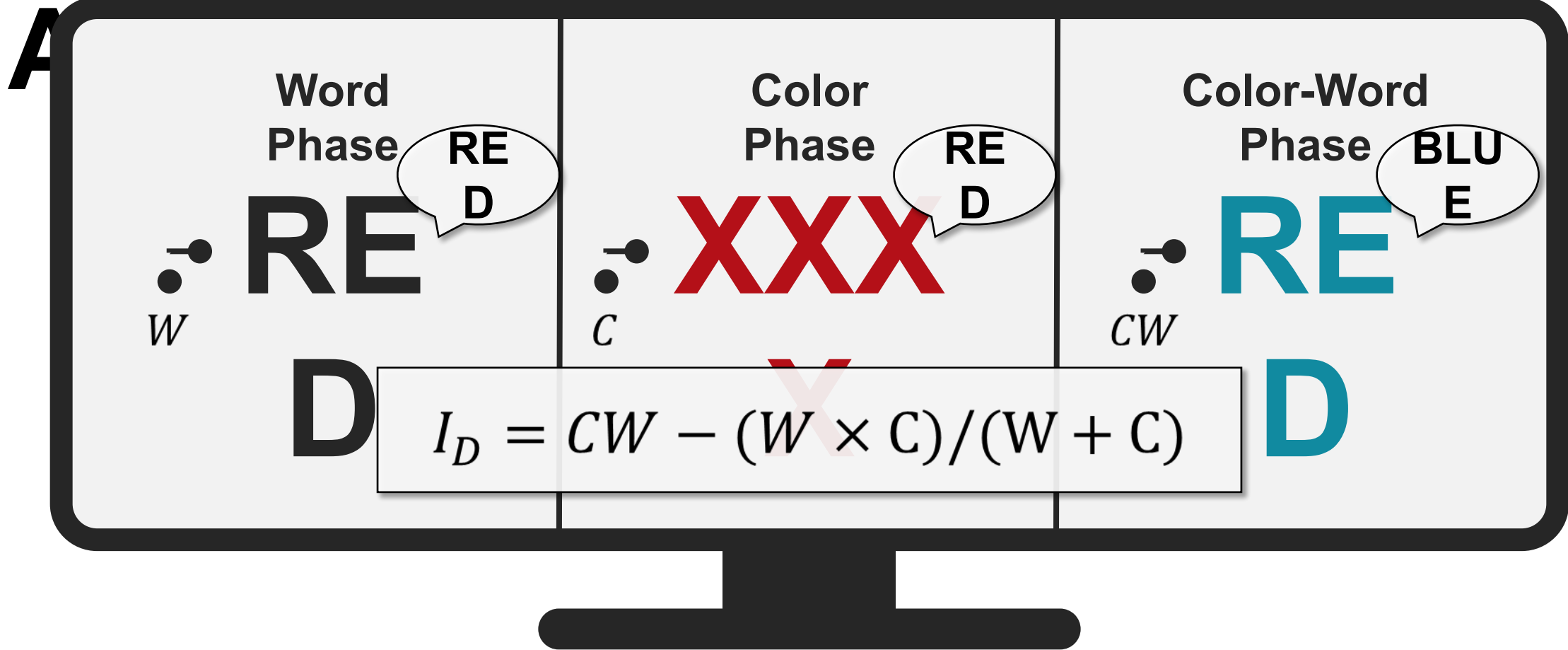
*Four score and seven years ago our fathers brought forth on this  
continent, a new nation, conceived in Liberty, and dedicated to  
the proposition that all men are created equal. Now we are  
engaged in a great civil war...*

WPM

EW

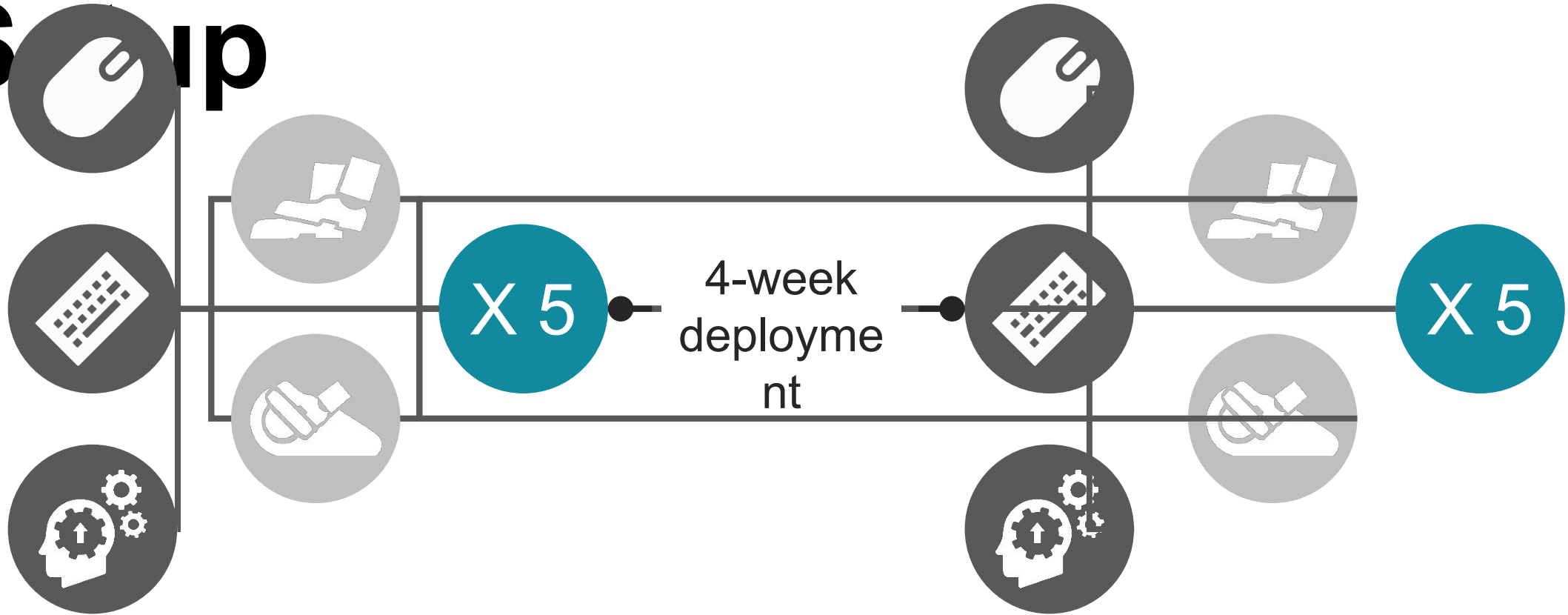
$$NWPM = WPM - EW$$

# Selectiv



# Experiment

Setup

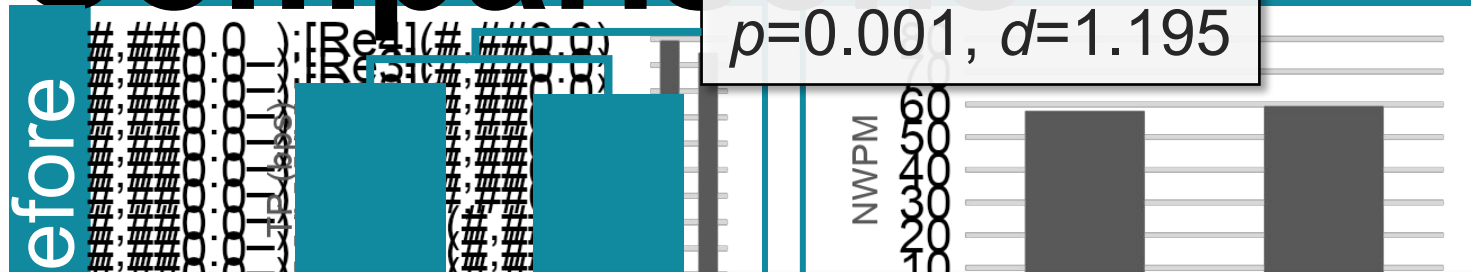


Before deployment

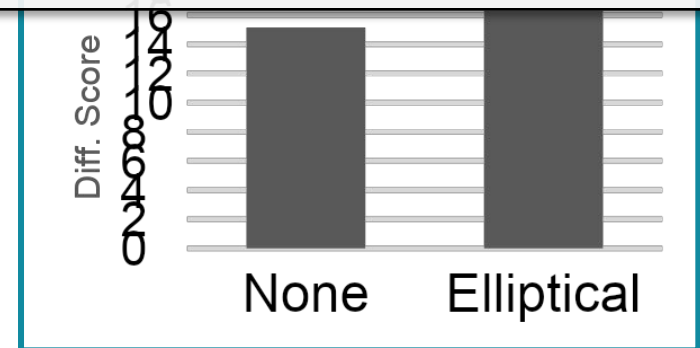
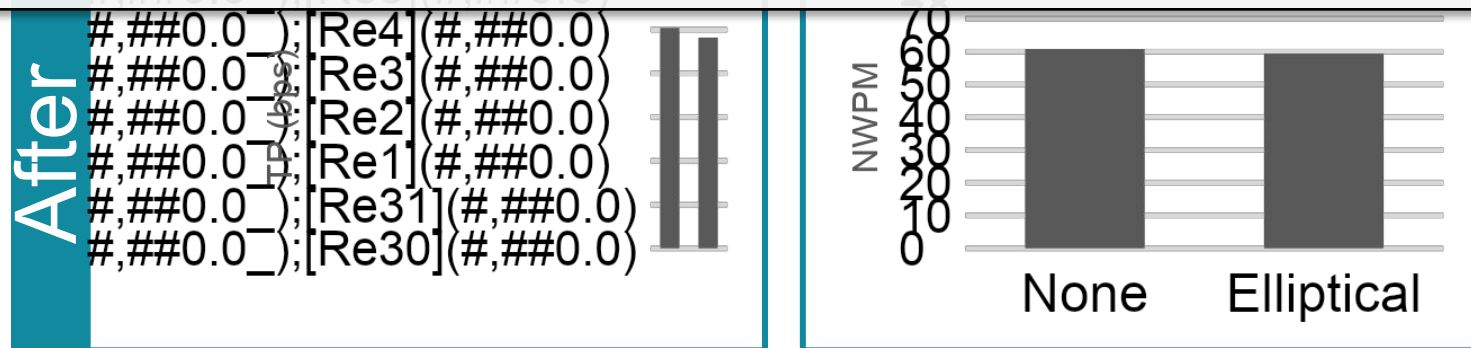
After deployment

# Performance

## Comparisons



Only < 8% differences!?



# In Summary,

The concurrent use of desk elliptical trainers results in minimal impact on work performance. So, we expected that office workers would use elliptical trainers without any work-related concern...

# Usage

How and why do office workers  
use elliptical trainers at work?

# Contexts

Usage Statistics  
Temporal Contexts of the Use  
Purposes of the Use



# Usage Statistics

2,691 strides taken 38.4 minutes of use  
with an elliptical trainer

Why did they use elliptical trainers only for a limited amount of time?

5 participants failed to meet the daily goal of 3,000 strides per day

# When they use



pedaled this machine while surfing the web or watching sports videos on YouTube during a rest [...] However, it was difficult to comprehend a novel or an unfamiliar paper while using this machine. [p11]



Selective use depending on  
received cognitive load

# Who they use



Since I use this machine in the office, I felt uncomfortable, because **someone noticed the pedaling motion and noise.**

[p8]



Selective use depending on **social environment**

# What they use



After eating a meal, I felt sleepy and could not concentrate on work, so I used the machine **to stay awake**. [p8]

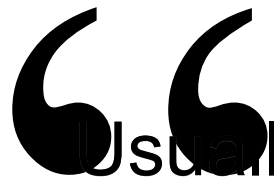
After completing a portion of work, I wanted **to relax myself**.  
Then, I used this machine. [p10]



Mental

**refreshment**

# What they use



Usually, I pedaled this machine hard in short bursts [...] For the effect of exercise, it may be better to intensively use the machine. [p10]



workout

using an elliptical trainer

# What they use

“



I placed my feet on the pedals almost all day. [...] Unlike fast pedaling for exercise, I unknowingly pedaled. [p8]

I have a habit of shaking my legs, but placing my foot on the pedals changed this habit into pedaling. [p4]

”

rests and fidgeting

# In Summary,

Participants **selectively** use elliptical trainers **depending on** cognitive load of their primary tasks, in spite of minimal impact of elliptical trainers on task performance.

Elliptical trainers are used for the purpose of workout, [redacted] [redacted] as well as mental refreshment and footrests.

# Feeling about it

How do office workers feel about  
the use of an elliptical trainer at work?

Intrinsic Motivation

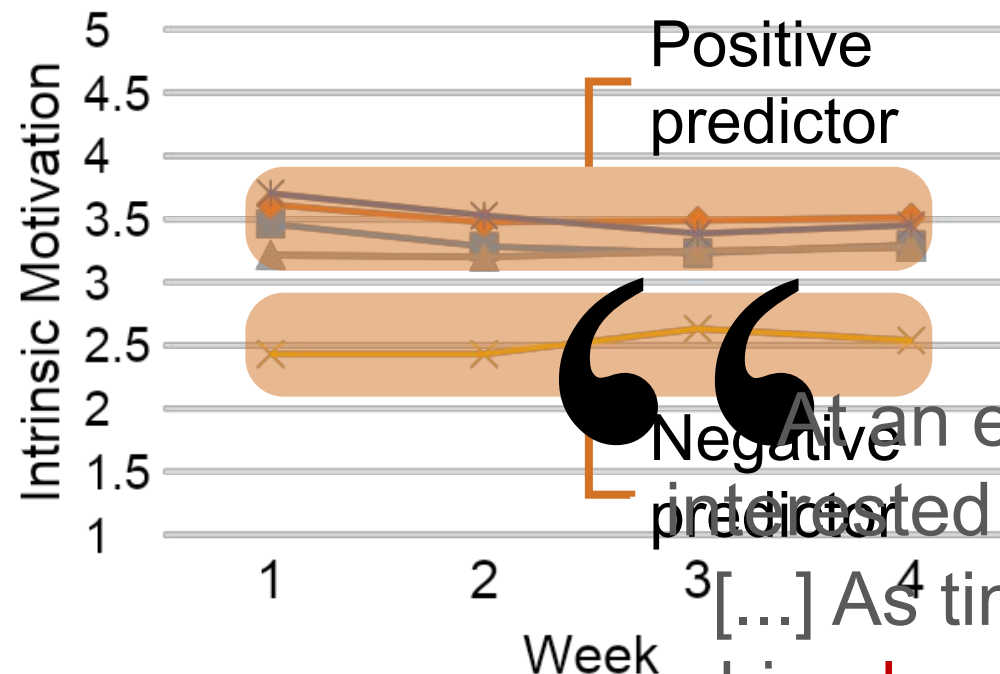
Task Load

Perceived Exertion

Office as Exercise Environment

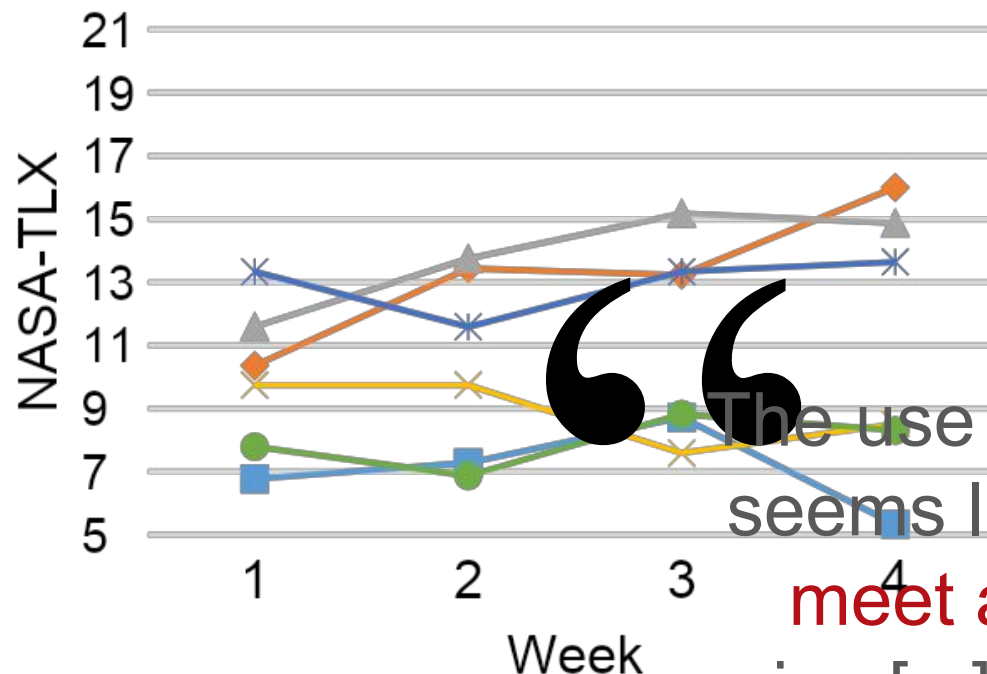


# Intrinsic Motivation



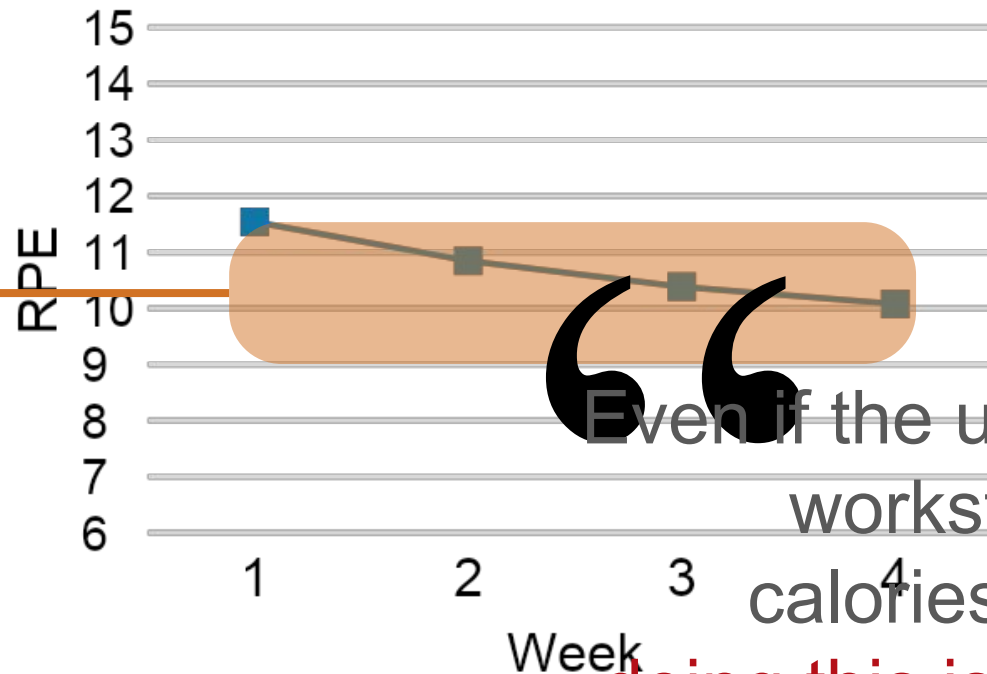
- Interest/Enjoyment
- ◆ Perceived Competence
- ▲ Effort/Importance

# Task Load



“The use of this machine seems like a mission to meet a daily goal, not exercise [...] I should spend time to achieve 1000 strides.” [p7]

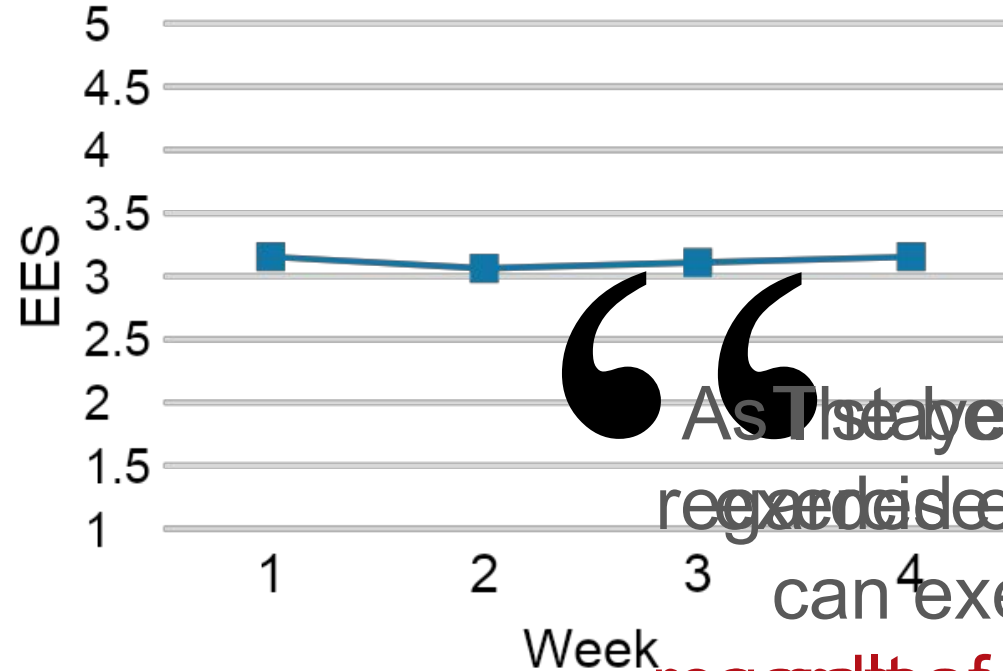
# Perceived Exert



Even if the use of the active workstation may burn calories a little bit, **only doing this is not enough for fitness.**

Light intensity workout  
(9: very light / 11: light)

# Exercise Settings of



As the stayest i ad h an office of  
reg exercise at work is that  
can exercise everyday  
regardless of back conditions  
conditions [p18]

# In Summary,

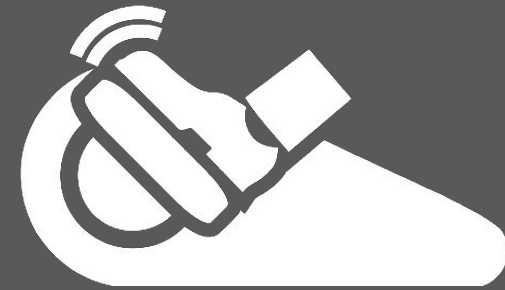
Participants were positively motivated to use the elliptical trainer, even though the motivation slightly decreased and task load somewhat increased over time.

Elliptical workout gave light intensity of exertion, and there was both pros and cons of using the workplace as an exercise setting.

# Implicatio



Selective health  
intervention  
depending on work  
context



Interactions  
through  
active workstations

# Summa

Through our explorative study on under desk elliptical trainers and their user experiences,

- (1) The use of elliptical trainers has **a minimal impact on work performance**, but,
- (2) Decision of exercise during working hours mainly depends on the **perceived cognitive loads of primary tasks**.
- (3) There are **positive usage motivations**, but it should be mitigated motivation drop and practical problems (e.g., noise)

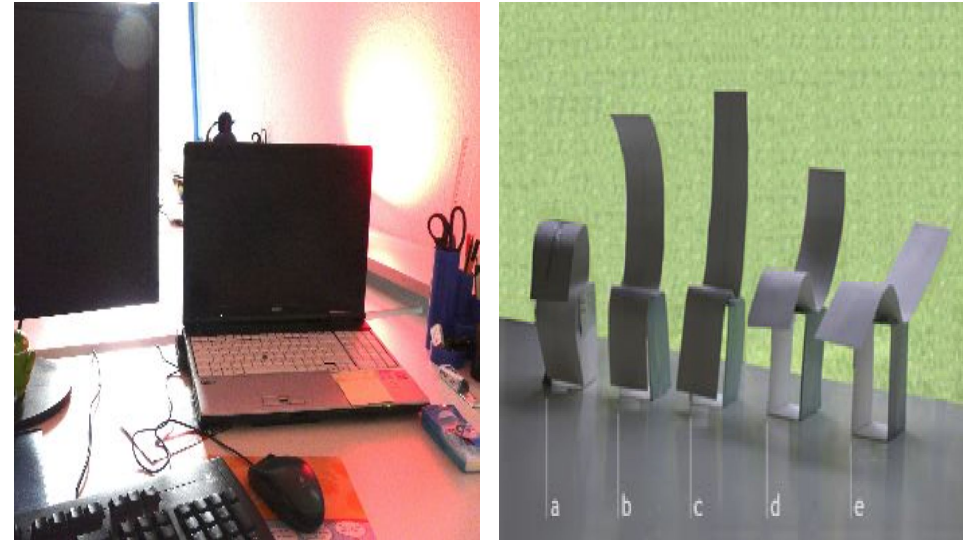
# Heat Intervention at Work

Reduce sedentary time



Detecting prolonged sedentariness / taking a simple workout

Through office appliances



Deliver awareness of a level of physical activities through office appliances