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Summary of Doctoral Dissertation “Hidden costs of job demands-employee working style misfit”

Theoretical Part of Dissertation

Introduction

The problem of misfit between job demands and employee characteristics is an important area of research in managerial studies, specifically in the area of human resource management. How well employees handle performing tasks under challenging situations, such as: time pressure, supervision or negative feedback, in the workplace is related to the amount of stress they experience. This, in turn, can produce costs for the organization in the form of absenteeism, increased fluctuation, and decreased worker productivity. For the employee it can lead to burnout or boreout, along with the negative health and personal consequences associated with them.

Previous research concerning the topic has focused on subjective, questionnaire methods of assessing the costs of job demands-employee working style mismatch. The subjective rating of costs to the employee is important, as they are related to how the employee views his or her work, and thus are related to employee satisfaction and work climate. Other costs, related to burnout and illness are more strongly related to objective measures, as has been shown in the closely related field of organizational psychology. These two styles of measuring psychophysiological costs are oftentimes weakly correlated.

In the present work both the subjective and objective costs of the mismatch between job demands and employee working style are examined. The work consists of a theoretical part, in which the problem of stress in the workplace and

its subjective and objective measurement and consequences are addressed, empirical part consisting of five studies, one correlational, and four experimental in which the hypotheses relating to subjective and objective psychophysiological costs are tested, and a supplementary part in which additional information concerning the materials is provided. The majority of the studies were carried out as part of the NCN Preludium grant project nr. 2017/25/N/HS4/02137 titled “The effect of multitasking, time pressure, and information overload on employee’s psychophysiological costs and work outcome” of which the author is the Grant Holder

Job demands-employee working style misfit

- Some people are better predisposed to certain workplace tasks. For example two characteristics of employees that allow them to multitask more efficiently are: working memory capacity and academic performance¹.
- Szymura and Nęcka² demonstrated the negative consequences of the misfit between temperament and task characteristics in a study on the differences between introverts and extroverts while multitasking. In this study introverts performed better than extroverts when faced with a task in which they could fully focus on a single task rather than multitasking, while extroverts performed better when they had to switch between two tasks.
- The mismatch between personality mechanisms (e.g. preference for methodical work) and the resource amount a person possesses, determined by his or her temperament (e.g. reactivity), has been described as an internal and lasting “sore point”³.
- Based on incentives, employees may change their working styles in accordance to what is required of them. This has been shown in a study⁴ where participants changed their level of precision while executing a task in accordance with instructions. Despite this their subjective rating of the task remained the same.
- Despite the subjective costs remaining the same, studies on job requirements-employee personality misfit have found that⁵:

¹ Morgan et al., 2013

² Szymura and Nęcka, 1998

³ Eliaz, 2006

⁴ Wieczorkowska, 1998; Wieczorkowska et al., 2009

⁵ Jeśka, 2016; Wieczorkowska, Król, Wierzbński, 2015

- employees that have a preference for non-methodical work incur greater emotional costs when engaged in highly proceduralized work than those that have a preference for methodical work;
 - in workplaces in which there are less procedures, employees low in reactivity earn more;
 - individuals that are low in reactivity deal with energetically and cognitively depleting tasks (such as multitasking) better than those that are highly reactive.
- From this we can see there is a mismatch between what people report when performing tasks that do not fit their temperament and working style and the emotional and financial costs they incur as a result.

Costs of stress caused by job demands - employee working style

- Workplace stress can be defined as defined as: “The change in one’s physical and mental state as a response to the appraised challenge or threat to that employee.”⁶.
- In the person-environment misfit ⁷ theory workplace stress is seen as a consequence of a mismatch between the workplace and employee characteristics.
- A 2013 study made by the All- Polish Alliance of Trade Unions found that 37% of employees in Poland reported high levels of stress in the workplace, while another 36% reported a medium level of stress⁸.
- It is estimated that between **50-60% of absenteeism** in the United Kingdom is related to **workplace stress** directly or indirectly (HSE, 2018)
- Absenteeism, on average, costs an average company 15%-20% of direct payroll expenses in the US and Canada⁹.
- A stressful work environment may result in negative psychological health problems such as depression, anxiety, prolonged fatigue, and the development of substance abuse problems¹⁰.
- Chronic workplace stress can lead to the development of coronary thrombosis, hypertension, and stroke¹¹.

⁶ Colligan & Higgins, 2006

⁷ French, Caplan, & Van Harrison, 1982

⁸ OPZZ, 2013

⁹ Kocakulah et al. 2016

¹⁰ Gianakos, 2002

- A compilation of 27 cohort studies conducted on sample of 600.000 residents of Europe, USA, and Japan found that risk factors associated with workplace stress increased the likelihood of developing a cardiovascular disease or stroke by 10 to 40%¹².

Problem of subjective and objective measurement of psychophysiological costs in managerial studies

- Both subjective and objective measures have their place in organizational research, and although they are usually found to be weakly or moderately correlated, they can reflect different aspects of such dimensions as career success¹³, employee performance¹⁴, and well-being¹⁵. Both of which can be important for human resource management.
- For example, while the determinants of objective career success are more strongly correlated with sociodemographic and human capital variables, subjective career success was more strongly related to stable personal differences and organizational support.
- Another example is that of stress in the workplace. Objective measures of stress can measure the physiological reaction of an employee to the demands of the workplace environment, while the subjective measures are more related to his or her appraisal of the situation¹⁶. Both of which can be important from a managerial perspective.
- Although self-report is the most common way of studying the psychophysiological costs of work in managerial research, it is recognized that findings based on questionnaire research may be spurious, do to several factors¹⁷:
 1. *Social desirability*: people tend to respond to questions in a way that is socially desirable.
 2. *Consistency motif*: people tend to respond in a way that is consistent with their understanding of how organizational phenomena are related (lay theories)

¹¹ Bosma, Peter, Siegrist & Marmot 1998

¹² Kivimäki & Kawachi, 2015

¹³ Ng et al., 2005

¹⁴ Bommer, Johnson, Rich, Podsakoff & MacKenzie, 1995

¹⁵ Muldoon et al., 1998

¹⁶ Lazarus, 1990

¹⁷ Podsakoff & Organ, 1986

3. *The common method variance problem*: the artificial inflations of correlations resulting from individuals having a consistent bias in answering questions on similar topics
- Although the problem of costs of working-style job demands mismatch has been studied using questionnaire based, self-report measures it is important to see how objective measures of these costs are impacted as well.

Theoretical model

- The theoretical model was inspired by the literature review and included the relationships between the following variables:
 - workplace stressors, for example:
 - time pressure (present, absent),
 - supervision (present, absent),
 - type of feedback (positive, negative);
 - employee temperament (e.g. reactivity),
 - employee working style (e.g. methodicality),
 - subjective psychological costs,
 - objective psychophysiological costs.
- An employee with greater energy resources: a greater resilience to external, stressful stimuli, and who is characterized by lower reactivity, should incur smaller objective psychophysiological costs when performing tasks under common workplace stressors than an employee whose temperament characteristics leave him or her with energetic resources.
- The subjective psychophysiological costs while performing a task under common workplace stressors will depend predominantly on an employee's preferred working style.
- The energy resources that an employee possesses, due to his or her temperament traits, such as reactivity, will modify the relationship between their working style and the objective psychophysiological costs he or she experiences under stressful work situations.

Research questions

- Q1. How do employee's temperament and preferred working styles moderate the effect of stressors on psychophysiological costs?
- Q2. What is the relationship between objective and subjective psychophysiological costs when performing task under different types of stressors?
- Q3. How are predicted and actual psychophysiological costs related when performing tasks under stressors?

Empirical Part of Dissertation

Hypotheses

The hypotheses were formulated in respect to objective and subjective psychological costs while performing tasks with 3 types of workplace stressors compared to baseline.

They were:

- *H1*: the higher reactivity, the higher the objective costs in the situation of:
 - negative feedback (*H1a*)
 - time pressure (*H1b*)
 - supervision (*H1c*)
- *H2*: The objective costs depend on the interaction of reactivity and methodicality in the situation of:
 - negative feedback (*H2a*)
 - time pressure (*H2b*)
 - supervision (*H2c*)
- *H3*: the stronger methodicality (working style), the higher the subjective costs in the situation of
 - negative feedback (*H3a*)
 - time pressure (*H3b*)
 - supervision (*H3c*)

Study 1: Psychophysiological costs of repetitive work tasks

- The goal of Study 1 was the comparison of subjective and objectively measured psychophysiological costs of performing a typical office-work task: checking emails.
- An additional goal was to examine if repeated exposure to this type of task is significantly alters its psychophysiological costs
- *Participants*: 12 employees (66% female) at the University of Warsaw. Their age was between 27 years and 61 years ($M = 37.5$ years; $SD = 8.76$ years).
- *Tasks*:
 - **Email sorting task**: In the study participants completed an office-like administrative task in which they sorted fictional incoming emails from students.
- *Dependent variables*:
 - **Subjective costs**: Russell's Affect Grid¹⁸ was used to measure subjective costs. The Affect Grid is a 9 by 9 grid, where higher boxes on the grid represent increased stress or arousal, while boxes to the right are used to indicate more positive mood.
 - **Objective costs**: Pulse rate variability calculated from the signal of an optical pulse-wave sensor.
- *Procedure*: In the study participants completed the e-mail sorting task a total of nine times across three days. Before the first task and after completing each task the participants were asked to indicate their how they felt while performing the task using the Affect Grid.
- *Results*:
 - higher objective costs when performing the task than at rest,
 - no difference in SC.

Study 2: Exploring working styles and temperament

- The goal of Study 2 was twofold: to examine the distribution of temperament and activity styles in the studied population, and to establish which of these are linked to perceiving certain situations as more subjectively costly to the participants.

¹⁸ Russel, Weiss & Mandelsohn, 1989

- These measures were used as a reference for these values in the subsequent studies.
- *Participants*: 328 students (69% female) from the University of Warsaw aged 18 to 42 years (M=20 years, SD=1.68 years) from the Faculty of Management participated in the study. Many were part or full-time employees.
- *Materials*: In Study 2 an extended version of the Survey of Activity Styles (SAS) was used to measure the participants characteristics (see below)
- Explained variables
 - The participants were asked how stressed they usually feel under one of the following conditions: negative feedback, time pressure, and supervision while performing work.
- *Predictors* The following scales were used from the SAS
 - reactivity,
 - methodicality (preference for methodical working style),
 - sequentiality (preference for sequential working style),
 - self-esteem,
 - need for achievement,
 - extraversion,
 - emotional well-being.
- Results:
 - Reactivity was positively related to rating all types of pressure as stressful.
 - Self-esteem was negatively related to rating negative feedback and supervision as more stressful.
 - Need for achievement was positively related to rating negative feedback as stressful.
 - Extraversion was negatively related to viewing supervision as stressful.
 - The higher the reactivity the more methodicality was related to rating supervision as stressful (interaction effect).

Studies 3, 4, and 5: Negative Feedback, Time Pressure, and Supervision

- *Participants*: The participants were recruited among those that participated in Study 2. They were 89 students (66% female) aged from 18 to 42 years ($M = 20.40$, $SD = 2.42$ years) from the University of Warsaw, many were part or full time employees. All 89 participants agreed to take part in study 3, 4 and, 5.
- Dependent variables in all studies:
 - **Subjective psychological costs**: The subjective psychological costs were taken as the mean of the responses on a 5-point indicating how strongly the participants felt during the task in the following ways: stressed, bored, worried, and irritated.
 - **Psychophysiological costs**: pulse rate variability was obtained from a wristband equipped with an optical pulse rate sensor.
- Controlled variables in all studies:
 - **Rating of task**: Five questions were used to assess how the participant rated each task they were: “How difficult was the task for you?” “How stressful was this task for you?” “How much pressure did you feel when performing the task?” “How engaging was this task for you?” “How pleasurable was this task for you?”
 - **Temperament and working styles**: The participants’ reactivity and preference for a methodical working style were taken from the SAS questionnaire in Study 2.

Study 3: Negative feedback

- *Manipulation*: In the study participants were randomly divided into 2 groups where they completed the distraction task with:
 - E1: positive feedback (message e.g.: “good job” or “you are doing very well”) then negative feedback (message e.g. “Why is this taking so long”, “you are making a lot of mistakes”).
 - E2: in reversed order: first negative feedback, then positive feedback.
- Task:
 - **Distraction task**: For the purposes of Study 3 a modified, computer-based version of the Stroop task was used. During the task participants were shown words and were asked to indicate the color of the word as quickly as possible while ignoring the word’s

meaning. The chosen words were names of colors. Some were the same as the color of the font, for example the word “blue” written in a blue font, while other were incongruent, for example the word “green” written in a yellow font.

- The results of the hypotheses tests in the study can be seen in Table 1 and the interaction of methodicality and reactivity on objective costs (Hypotheses *H1a* and *H2a*) can be seen in Figure 1.

Table 1. The detailed hypotheses tested in the *negative feedback* study.

Hypothesis	Supported
In a situation with <i>negative feedback</i> the higher the reactivity the higher the objective costs (<i>H1a</i>)	Yes
In a situation with <i>negative feedback</i> there will be an interaction effect of reactivity and a methodical working style on objective costs (<i>H2a</i>)	Yes
In a situation with <i>negative feedback</i> there will be higher subjective costs with a more methodical working style (<i>H3a</i>)	Yes

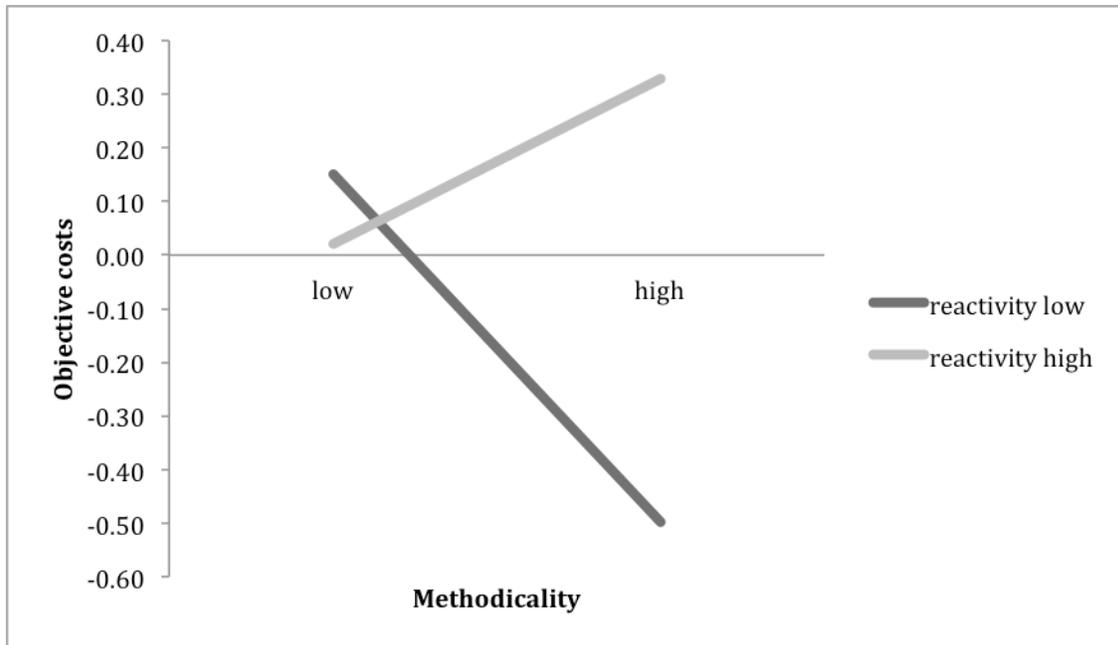


Figure 1. Interaction plot of the effect of methodicality and reactivity on objective costs during negative feedback. Low and high correspond to one standard deviation above and below average.

Study 4: Time pressure

- *Manipulation:* In the *time pressure* study participants were randomly divided into 2 groups where they completed the email segregation task with:
 - E1: first no time pressure then with time pressure.
 - E2: in reversed order: first with time pressure, then without time pressure.
- Task
 - **Email sorting task:** In this task the participants were asked to perform an administrative-like task, that is sorting incoming emails based on their subject and intended recipient. In the version with the time pressure the inbox got filled out at an accelerating rate while the version with no time pressure was self-paced.
- The results of the hypotheses tests in the study can be seen in Table 2, and the interaction of methodicality and reactivity on objective costs (Hypotheses *H1b* and *H2b*) can be seen in Figure 2.

Table 2. The detailed hypotheses tested in the *time pressure* study.

Hypothesis	Supported
In a situation with <i>time pressure</i> the higher the reactivity the higher the objective costs (<i>H1b</i>)	No
In a situation with <i>time pressure</i> there will be an interaction effect of reactivity and a methodical working style on objective costs (<i>H2b</i>)	Yes
In a situation with <i>time pressure</i> there will be higher subjective costs with a more methodical working style (<i>H3b</i>)	Yes

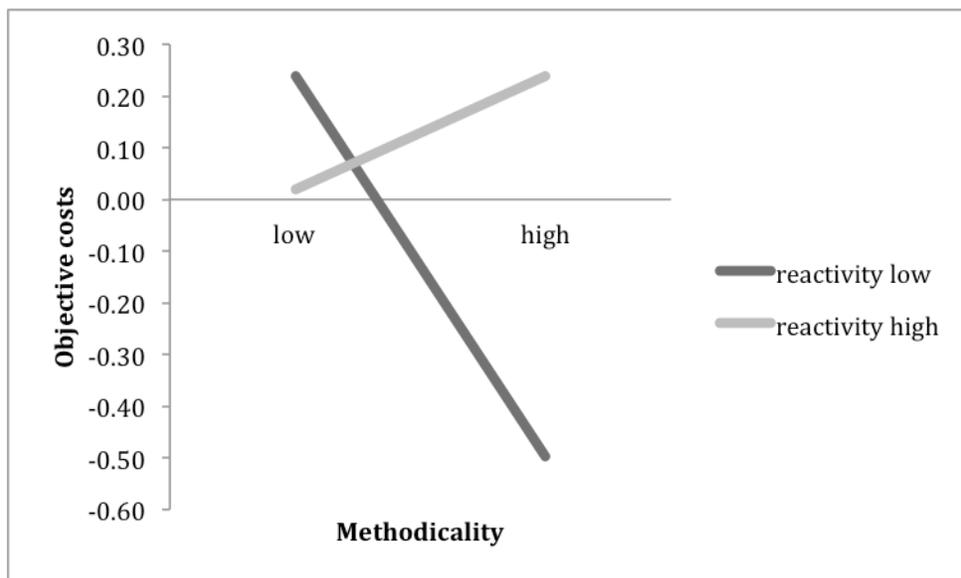


Figure 2. Interaction plot of the effect of methodicality and reactivity on objective costs during time pressure. Low and high correspond to one standard deviation above and below average.

Study 5: Supervision

- *Manipulation:* In the *supervision* study participants were randomly divided into 2 groups where they completed the dual task with:
 - E1: no supervision then while under supervision of the experimenter.

- E2: in reversed order: under supervision, then without supervision.
- Task
 - The **dual task** is a computer-based task designed around a test that is intended for evaluating a participants' attention switching capabilities: the Trail-Making Task¹⁹ (TMT). In this task the participants are asked to alternatively join elements from two sequences one of letters and another of numbers in ascending order, switching from one to the other.
- The results of the hypotheses tests in the study can be seen in Table 3 and the interaction of methodicality and reactivity on objective costs (Hypotheses *H1c* and *H2c*) can be seen in Figure 3.

Table 3. The detailed hypotheses tested in the *supervision* study.

Hypothesis	Supported
In a situation with <i>supervision</i> the higher the reactivity the higher the objective costs (<i>H1c</i>)	Yes
In a situation with <i>supervision</i> there will be an interaction effect of reactivity and a methodical working style on objective costs (<i>H2c</i>)	Yes
In a situation with <i>supervision</i> there will be higher subjective costs with a more methodical working style (<i>H3c</i>)	No

¹⁹ Sanchez-Cubillo et al., 2009.

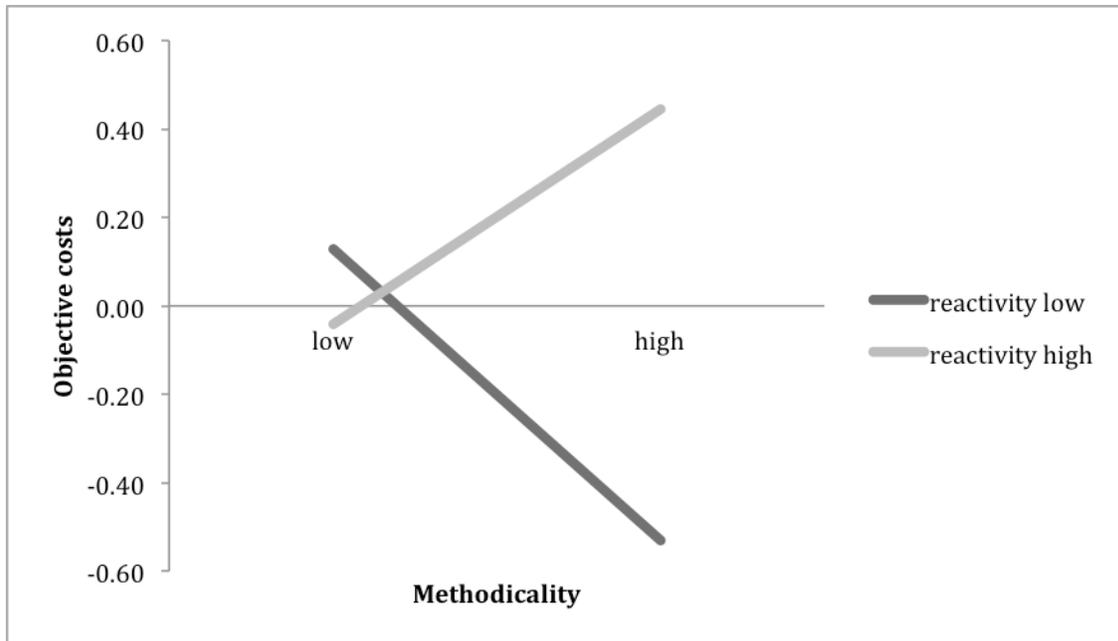


Figure 3. Interaction plot of the effect of methodicality and reactivity on objective costs during supervision. Low and high correspond to one standard deviation above and below average.

Discussion of studies and their application to future research

- The studies demonstrated that a questionnaire assessment of employee temperament and working styles (using the Survey of Activity Styles) could predict not only an employee's subjective feelings, but also the objectively measured psychophysiological costs of performing work tasks under common workplace stressors
- During the last three studies, it was found that although employees with a temperament predisposing them to higher objective costs of common workplace stressors are likely to identify such situations as generally stressful for them, they do not report higher subjective costs when actually performing the tasks.
- It was found in the studies that certain working styles predispose employees toward higher subjective costs when performing work task under common job stressors..
- Contrary to subjective costs, the relationship between objective costs of performing work tasks under common workplace stressors and working style was dependent on employee temperament (reactivity). If the employee reactivity was low enough, increased methodicality decreased

- objective costs when performing the tasks under pressure. Subjective costs, on the other hand, always increased when performing work tasks under negative feedback and time pressure with increased methodicality, irrespective of employee temperament.
- Based on these studies, it can be seen that employees are not very accurate in predicting their subjective and objective costs when performing work tasks in typically stressful work situations.
 - Study limitations:
 - All of the experimental tasks had some sort of blend of time pressure, negative feedback, and supervision, which was inherent to the experimental procedure.
 - Study One used a small sample size, while the subsequent studies were performed on a sample of younger adults. The results of the studies may not be generalizable to the population of older adults.
 - The tasks had low ecological validity. While the tasks were chosen in an effort to replicate certain work task characteristics, the work environment and work tasks are quite different in a number of important ways.
 - First of all, these tasks were probably less personally relevant to the participants, as how well they completed them had no impact on their career.
 - Second of all, the tasks had to be fairly simple, and this simplification may not be directly comparable to, for example, having to multitask on a couple important tasks at once.
 - Third of all participants had no prior experience in doing these tasks, something which they would have when performing tasks at work.
 - Recommendations:
 - **Motivating employees:** If an employee prefers to follow a pre-determined method of doing tasks assigned to him or her, using negative feedback or time pressure would likely result in the employee feeling worry, anxiety, or stress. If the employee is highly reactive, than any pressure could result in greater objective psychophysiological costs, which over the long run could result in declining health or burnout.

- **Assigning work tasks:** guiding an employee by discussing how certain work characteristics fit into his or her preferred working style and then letting them decide on choosing their tasks may lead to lower subjective and objective costs of performing work tasks.
- **Work environment:** temperament, and not just employee preferences, may be important in determining in which environment the employee will perform optimally
- **Measuring objective and subjective costs:** The subjective measures in the studies were related to employee preferences, and the objective measures related more strongly to employee temperament, which highlight why both are important to consider when evaluating employee-workplace environment fit.

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