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## Your Gadgets, Stress, and Performance: The Influence of Technostress on Individual Satisfaction and Performance

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# Your gadgets, stress, and performance: The influence of technostress on individual satisfaction and performance

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## Abstract

The Covid-19 pandemic changes the way employees work, and the use of technologies to support their work is increasing. The aim of this study is to investigate whether technologies can harm employee satisfaction and performance. The hypothesis developed stated, that the technostress creator predicted each individual role performance differently. Job satisfaction also became a mediator, whereas the technostress inhibitor was a moderator of the relationship between the technostress creator and job satisfaction. Two hundred and forty-four online responses were collected from employees in cities during the Covid-19 pandemic. Technostress (Ragu-Nathan et al., 2008), job satisfaction (Hackman & Oldham, 1976), and individual work performance (Griffin et al., 2007) questionnaires were used. The data were analyzed using path analysis. The results suggested that the technostress creator only statistically predicted individual task proficiency ( $\beta = -0.124$ ,  $SE = 0.060$ , and  $p = 0.039$ ) and proactivity ( $\beta = 0.134$ ,  $SE = 0.060$ , and  $p = 0.026$ ). The results found no effects from the mediator or moderator on the prediction of job satisfaction and individual role performances. Therefore, the technostress creator only increased employee stress if the technologies used disrupted their work. However, to some extent, the technostress creator can increase employee innovation when finishing work.

## Keywords

COVID-19, individual role performance, job satisfaction, technology, technostress creator, technostress inhibitors.

The Covid-19 pandemic has dramatically changed the way people work (Kingma, 2019; World Health Organization, 2020). Employee performance is expected to possibly decrease by approximately 46% throughout the pandemic (Boichenko & Tymchenko, 2020). Simultaneously, technology use in many business-related areas, including remote working and collaboration, has surged at

a rate of up to four years faster than previously anticipated—a rate that might not change even if the pandemic ends (Laberge et al., 2020). Constant use of technologies for both working and receiving information about the pandemic might influence employees' stress levels (Garfin, 2020). This study investigates how technostress predicts employee performance when mediated by job satisfaction (Bakotić, 2016; Ragu-Nathan et al., 2008).

During the Covid-19 pandemic, employees face significant uncertainties linked to changes in how they must work or behave (Griffin et al., 2007; Kingma, 2019). During this unprecedented situation, assessing employee performance dif-

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ferently is preferred. Work role performance measures three individual behaviors (proficiency, adaptivity, and proactivity) across three levels (individual task, team member, and organization member behaviors) (Griffin et al., 2007). In this study, the focus is only on individual role performances that show the effectiveness of an employee at work, particularly when faced with uncertainty, primarily because individuals' understanding of the expectations of their skills and behaviors on their job is investigated. This investigation also includes how individuals could adapt effectively and change their behaviors to enhance their performance (Griffin et al., 2007). Similar to other job performance measurements, individual task proficiency measures how well the employees complete their work. Individual task adaptivity assesses how employees adjust the way they work in terms of new equipment, processes, or procedures. Furthermore, individual task proactivity examines how employees can create initiatives to make their jobs easier and faster to finish. Several studies used work role performance measurements to measure employee performance under uncertain conditions (Leong & Rasli, 2014; Neal et al., 2012; Pennaforte, 2016). The ability to be proficient, adaptive, and proactive is important during the pandemic. Employees must also use technologies to support their work from home, which might create stress, particularly if they cannot adapt and be proactive when addressing the situation. In this study, we investigated how technostress predicts individual role performance.

To reduce the spread of the Covid-19 virus in Indonesia, the government introduced restrictions called pembatasan sosial berskala besar (PSBB) in many urban areas, such as Jakarta, Bekasi Surabaya, and surrounding regions (Pembatasan Sosial Berskala Besar, 2020). Subsequently, the PSBB then evolved into different restrictions called Perberlakukan Pembatasan Kegiatan Masyarakat (PPKM; Moegiarso, 2021). Both restrictions prohibited employees from working in their offices; instead, they had to work from home. Employees were required to use some form of information and communication technology (ICT) to stay connected with their colleagues and organizations. Such ICT includes, for example, using zoom to conduct meetings, using specific software to complete

group tasks, and so on. Technology usage assists employees in completing their work but might also create stress (Song & Gao, 2020). Stress related to technology use is called technostress (Ragu-Nathan et al., 2008). Technostress is derived from the transaction-based approach to stress (Lazarus & Folkman, 1984) and is then divided into two types: the technostress creator and the technostress inhibitor. The technostress creator refers to events or situations that create stress when employees use ICTs. Some examples of technostress creators include poor connections, Internet instability, data insecurity, and data overload. All of these can create stress and frustration when using ICTs, particularly given that Indonesia ranked 104 out of 137 countries in mobile Internet speed as per June 2021 (Speedtest Global Index, n.d.). However, technostress creators can be minimized if organizations provide technical support to employees; thus, facilitating proper and effective use of the ICTs. Such support is known as a technostress inhibitor (Ragu-Nathan et al., 2008).

In general, stress and the technostress creator have been recognized as negative predictors of both job performance and job satisfaction (Ansah et al., 2016; Jena, 2015; Sheraz et al., 2014; Tarafdar et al., 2015). In more recent studies in Western countries conducted prior and during the Covid-19 pandemic, technostress was studied to predict certain outcomes, such as workaholics, leadership, job satisfaction, and job performance (Al-Ansari & Alshare, 2019; Bauwens et al., 2021; Spagnoli et al., 2020). The results related to the relationship between technostress and job performance or job satisfaction are conflicting (Al-Ansari & Alshare, 2019; Tarafdar et al., 2015, 2019). On the one hand, ICTs can help employees to complete their work, while on the other hand, ICTs can also create technostress (Al-Ansari & Alshare, 2019). This phenomenon is also visible in Indonesia. A number of employees in urban areas, such as Jakarta, Bogor, and the surroundings, were forced to learn ICTs so that they could successfully work from home. Adapting and being proactive to the conditions might be easier for individuals already proficient in using ICTs to do their work but the same might not be for individuals who do not have good digital literacy. These conditions then can create high degrees of technostress for them (Ragu-Nathan et al., 2008).

In this study, the technostress creator might have a different effect on each facet of individual role performance. Because individual task proficiency relates to how employees undertake their jobs, workers who are not able to use ICTs properly are more likely to experience stress. However, not all stress negatively affects job performance and job satisfaction (Hargrove et al., 2013). The difficulty in using ICTs might drive an individual to adapt or find new ways to address the problem and work more efficiently. Therefore, arguably, the technostress creator positively predicts individual task adaptivity and proactivity. The following hypotheses were developed to investigate if the technostress creator predicts individual role performance.

H1: The technostress creator negatively predicts individual task proficiency.

H2: The technostress creator positively predicts individual task adaptivity.

H3: The technostress creator positively predicts individual task proactivity.

As mentioned, the technostress creator also relates to job satisfaction (Jena, 2015; Ragu-Nathan et al., 2008), which means that stress might affect job satisfaction. In addition, job satisfaction is one of the antecedents of job performance (Sheraz et al., 2014); employees experience it when they feel good about their work (Locke, 1976). In this study, job satisfaction is argued to mediate the relationship between technostress creator and individual task behaviors. Ragu-Nathan et al. (2008) also suggested that job satisfaction mediates the relationship between technostress and organizational outcomes, such as organizational commitment or job performance. This study posits that employees will likely become dissatisfied with their work if they feel frustrated when using ICTs. As a result, their performance is also likely to decrease. Therefore, the following hypothesis was developed.

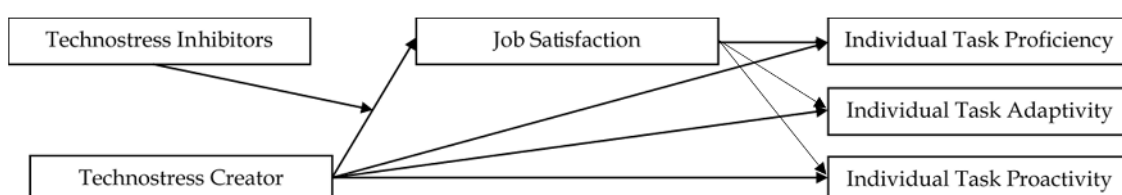
H4: Indirect effects on the relationship between the technostress creator and all facets of individual role performance are mediated by job satisfaction.

The negative effects of technostress on job satisfaction can be minimized through organizations' implementations of proper support mechanisms (Ragu-Nathan et al., 2008), which are called technostress inhibitors. Support might be provided in the form of proper training or suitable introduction to the new technologies, and continued training or learning resources to assist employees in gaining confidence when using ICTs. Employees who receive support from their organizations with ICTs feel at ease, assured that they can find help should they need it. Therefore, the implementation of ICTs within organizations can help employees complete their work efficiently and effectively. When employees feel confident, they are more likely to be satisfied with their work. Thus, the following hypothesis was suggested.

H5: A technostress inhibitor moderates the relationship between technostress creators and job satisfaction.

The model (Figure 1) has the potential to investigate the relationship between technostress and work role performance. Whether job satisfaction can mediate the relationship when moderated by the technostress inhibitor was also investigated. This study contributes to the literature by providing more empirical data on the effect of technostress, particularly in Indonesia, which is important because employees in urban areas might need to be more proficient, adaptive, and proactive when using ICTs to ensure that these ICTs promote instead of reduce their performance. A moderated mediation analysis was used to investigate the model.

**Figure 1.** *Conceptual Model*



## Methods

This study employed a quantitative cross-sectional design. Data were collected online using the Survey Monkey software (SurveyMonkey, 2020). Ethical clearance was obtained from the Faculty of Psychology, Universitas Indonesia: No. 873/FPsi.Komite Etik/PDP.04.00/2020.

### Participants

Links to online surveys were distributed to participants using a research poster on social media platforms, including Facebook, Instagram, and Line. After data screening (explained in the "Procedure" section), 244 participants were retained (51.6% male, Mage = 34.176 years, SD = 11.483) who resided in urban areas, such as Jakarta, Bogor, Yogyakarta, and the surrounding areas. Most (80.3%) worked in private organizations, finished at least four years of a diploma or bachelor's degree (63.9%), and either consistently (51.2%) or mostly (35.7%) worked from home.

### Measures

Three measurements were translated into Bahasa Indonesia using a translation procedure from Sousa and Rojjanasrirat (2011). Two people translated all items into Bahasa Indonesia, and two others with a strong proficiency in Indonesian-English translation transferred the text back into English. After each translating process, item synthesis was conducted to obtain a single version of each item. All measurements used seven-point Likert-style scales to minimize social desirability bias and any pressure to provide favorable responses (Chyung et al., 2017; Johns, 2005).

**Individual Role Performance.** Nine items from the work role performance questionnaire were used (Griffin et al., 2007). The measurements used six-point scoring scales, from "very little" to "a great deal." Some examples of items include "Adapted well to changes in core tasks," "Carried out the core parts of your job well," and "Made changes to the way your core tasks are done."

**Technostress.** Both technostress creators and

inhibitors were measured using 30 items from the technostress scales (Ragu-Nathan et al., 2008). Technostress creators consist of five dimensions and technostress inhibitors comprise three, with scores ranging from "strongly disagree" to "strongly agree." Some examples of technostress creator items include "I am forced by this technology to work with very tight time schedules" and "I feel a constant threat to my job security because of new technologies." Examples of technostress inhibitors items are "Our organization fosters a good relationship between the IT department and end users," "Our end-user help desk is easily accessible," and "Our end users are involved in technology change and/or implementation."

**Job Satisfaction.** Three items measuring job satisfaction were adapted from the "Global Job Satisfaction" questionnaire (Hackman & Oldham, 1976). Examples of these items include "Generally speaking, I am very satisfied with my job" and "I am generally satisfied with the kind of work I do in this job." Four points ranging from "strongly disagree" to "strongly agree" were used as psychometric scales.

Although they consisted of few dimensions, the technostress creators, technostress, and job satisfaction were treated as uni-dimensional variables. All variables were averaged to obtain the total scores. Reliability tests—Cronbach's Alpha (Cronbach, 1951) and McDonald's Omega (McDonald, 1999)—and confirmation factor analysis were conducted to test for the measurements' internal consistencies and validities. The reports for these tests are provided in the "Results" section.

### Procedure

The data were collected using two survey links that separated the independent and dependent variables. As a cross-sectional study was conducted, several remedies were used to control for common method bias (Podsakoff et al., 2012). First, both surveys were separated as if they were different studies and used different cover pages. Second, we minimized item ambiguities during the translation process to ensure that all items were easy to understand and did not create any double-barreled meanings. Third, all

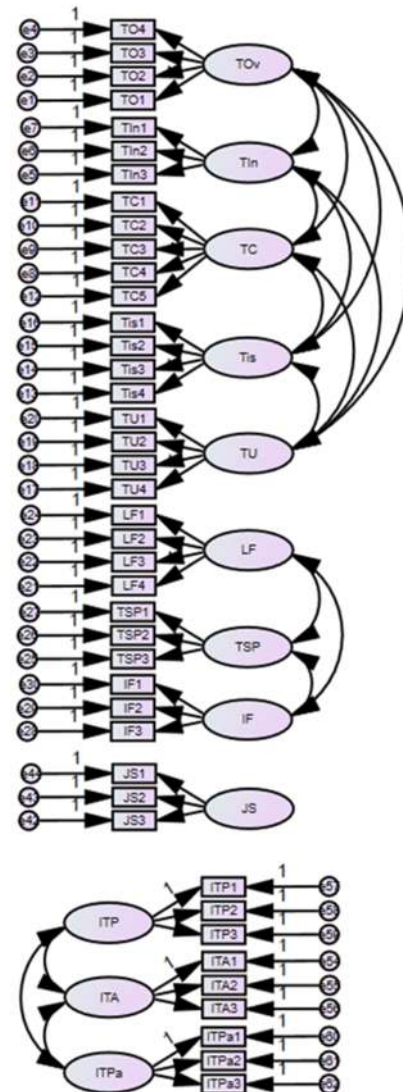
items were randomized, and all instructions specified that there were no right or wrong answers. Finally, the statistical remedies as reported in the “Results” section were investigated. In addition to reducing common method bias, participants’ attention was also checked by using check items (Kung et al., 2018). Examples of such items include “Are you sleeping right now?”; “Are you the first President of Indonesia?” and “Are you currently in a faint?”

All participants provided informed consent prior to answering the surveys, following an explanation of the purpose of the study, the risks, privacy related information, and rewards. When they agreed to participate, they indicated their agreement by clicking “yes” before continuing with the survey. All participants, if they wished, could then enter the draw to receive electronic money valued at Rp. 50,000 for each winner out of 100 people. Both surveys combined received 690 responses in total. However, only 258 participants answered both surveys. After screening to ensure attention, only 244 responses were received that could be further analyzed.

### Data Analysis

The data were analyzed using SPSS Version 26 (Corporations; IBM, 2019) and AMOS Version 26 (Arbuckle, 2019). Structural equation modeling (SEM) was used to test the moderated mediation analysis of the model. Three models in this study were analyzed using SEM. The first model (Figure 2) was used to investigate confirmatory factor analysis, whereby second-order factors from each variable were correlated for all items. The second model (Figure 3) was used to investigate the purpose model in this study wherein all variables were treated as observed variables, creating a simple model. The last model (Figure 3) was constructed to investigate the model with modification indices. As detailed in the “Results” section, model fit indices, such as the chi-square ( $\chi^2$ ), the comparative fit index, the Tucker-Lewis index, goodness-of-fit index (GFI), the root mean squared error of approximation, the standardized root mean square residual, the Akaike information criterion (AIC), and the Bollen’s consistent version of AIC (CAIC), were employed. Hooper et al. (2008) was used as a guide to address the cut-off for each fit index.

Figure 2. Confirmatory factor analysis



**Note.**

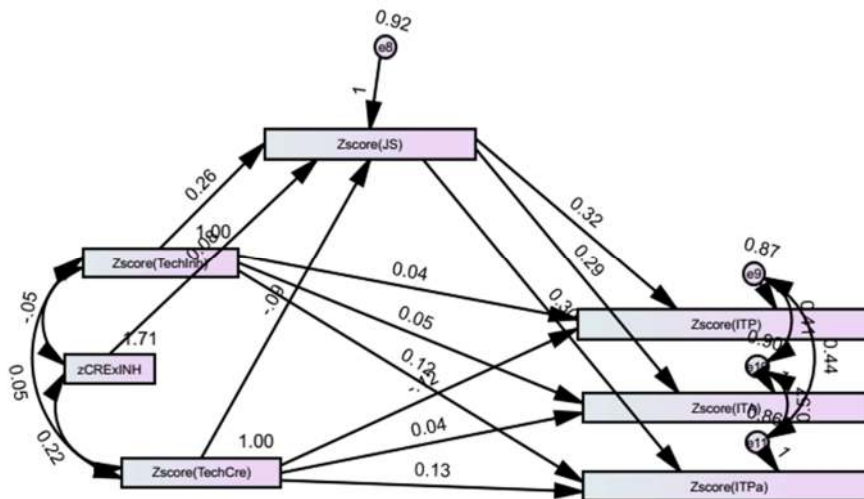
*Tov = Techno-Overload; Tin = Techno-Insecurity; TC = Techno-Complexity; TU = Techno-Uncertainty; LF = Literacy Facilitation; TSP = Technical Support Provision; IF = Involvement Facilitation; JS = Job Satisfaction; ITP = Individual Task Proficiency; ITA = Individual Task Adaptivity; ITPa = Individual Task Proactivity.*

## Results

### Preliminary Analyses

Before the data were analyzed based on 245 responses, some preliminary analyses were conducted in terms of data appropriateness using maximum likelihood estimation in SEM. First, no missing data was included as using the online survey software ensured that all the questions were answered by participants. Second,

Figure 3. A simple model to test the hypotheses



Notes:

ZScore = Standardized Scores; TechIn = Technostress Inhibitors; TechCre = Technostress Creators; ITP = Individual Task Proficiency; ITA = Individual Task Adaptivity; ITPa= Individual Task Proactivity; zCRExINH = Standardized Scores of Technostress Creator x Standardized Scores of Technostress Inhibitor; JS = Job Satisfaction.

the number of responses was deemed appropriate because it was higher than 200 (Kline, 2015). Third, a normality assessment based on the skewness (between -1.478 and 0.637) and kurtosis (ranging from -1.279 to 6.828) of the data showed that the data were considerably normal (Pituch & Stevens, 2016). Last, factor loadings for all items ranged from 0.002 to 0.822. Related to these factor loadings, only six items from the

technostress creator were lower than the cut-off of 0.04 (Hair et al., 2018; Pituch & Stevens, 2016). Thus, these items were removed from further analysis.

Table 1 shows the means, standard deviations, correlations, Cronbach’s alpha, and McDonald’s Omega of each variable. The technostress creator did not correlate with any other variables, whereas the technostress inhibitors

Table 1. Means, standard deviations, correlations, Cronbach’s alpha, McDonald’s Omega reliabilities

|                                 | M      | SD     | 1       | 2     | 3                           | 4                           | 5                           | 6                           | 7                           | 8                           |
|---------------------------------|--------|--------|---------|-------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| (1) Age                         | 34.176 | 11.483 |         |       |                             |                             |                             |                             |                             |                             |
| (2) Gender                      | -      | -      | -.188** |       |                             |                             |                             |                             |                             |                             |
| (3) Individual Task Proficiency | 4.179  | 0.546  | -.063   | .033  | <b>.748/</b><br><u>.750</u> |                             |                             |                             |                             |                             |
| (4) Individual Task Adaptivity  | 3.706  | 0.602  | -.026   | .059  | .511**                      | <b>.709/</b><br><u>.709</u> |                             |                             |                             |                             |
| (5) Individual Task Proactivity | 3.661  | 0.660  | .164*   | -.013 | .539**                      | .685**                      | <b>.819/</b><br><u>.821</u> |                             |                             |                             |
| (6) Technostress Creator        | 2.361  | 0.278  | .104    | .108  | -.140                       | .026                        | .123                        | <b>.711/</b><br><u>.667</u> |                             |                             |
| (7) Technostress Inhibitor      | 2.964  | 0.371  | .069    | .030  | .111                        | .126*                       | .199**                      | .051                        | <b>.809/</b><br><u>.811</u> |                             |
| (8) Job Satisfaction            | 3.079  | 0.522  | .151*   | .089  | .338**                      | .301**                      | .319**                      | -.057                       | .247**                      | <b>.799/</b><br><u>.799</u> |

Notes:

\*. Correlation is significant at the 0.05 level (two-tailed).

\*\*. Correlation is significant at the 0.01 level (two-tailed).

Diagonal values in bold are reliabilities results, underlined values are McDonald’s Omega.

**Table 2. Model fit indices**

|         | $\chi^2$ | $df/p$    | CFI  | TLI    | GFI  | SRMR | RMSEA | AIC      | Bodozgan's |
|---------|----------|-----------|------|--------|------|------|-------|----------|------------|
| Model 1 | 2282.077 | 1303/.000 | .774 | .761   | .736 | .053 | .056  | 2538.077 | 3113.715   |
| Model 2 | 222.124  | 6/.000    | .330 | -1.346 | .792 | .160 | .385  | 266.124  | 365.062    |
| Model 3 | 3.552    | 3/.314    | .998 | .988   | .996 | .028 | .028  | 53.552   | 165.981    |

Note. CFI = The Comparative Fit Index; TLI = The Tucker-Lewis Index; GFI = The Goodness-of-fit Index; SRMR = The Standardized Root Mean Square Residual; RMSEA = The Root Mean Squared Error of Approximation;; AIC = The Akaike Information Criterion; Bodozgan's = The Bodozgan's consisten version of AIC

only correlated with individual task adaptivity ( $r = 0.126$ ,  $p = 0.049$ ) and proactivity ( $r = 0.199$ ,  $p = .002$ ). Job satisfaction had positive and significant correlations with all individual task performance dimensions ( $r = 0.338$ ,  $p = 0.000$ ;  $r = 0.301$ ,  $p = 0.000$ ;  $r = 0.319$ , and  $p = 0.000$ , respectively) and technostress inhibitors ( $r = 0.247$ ,  $p = 0.000$ ). All reliability results were satisfactory at higher than 0.70 for both Cronbach's alpha and McDonald's Omega, except for the technostress creator's Omega, which was slightly lower than 0.70. Therefore, the data were sufficient for further analysis using path analysis in SEM.

The data were analyzed using the maximum likelihood estimation in AMOS to test the proposed three models. Table 2 provides the model fit indices for all tested models explained in the data analysis section. The model fit indices increased significantly after the model re-specification using modification indices (MI). In Model 3, errors for individual task performance

dimensions were allowed to correlate, as suggested by the MI values. Therefore, the results suggest that Model 3 has the best GFI. Model 3 was then used to test the hypotheses.

Table 3 provides the results of the SEM. The technostress creator was positive and significant at the 0.05 level with individual task proactivity ( $\beta = 0.134$ ,  $SE = 0.060$ , and  $p = 0.026$ ) but had a negative relationship with individual task proficiency ( $\beta = -0.124$ ,  $SE = 0.060$ , and  $p = 0.039$ ). Individual role performances were significantly and positively predicted by job satisfaction (proficiency:  $\beta = 0.332$ ,  $SE = 0.062$ , and  $p = 0.000$ ; adaptivity:  $\beta = 0.291$ ,  $SE = 0.063$ , and  $p = 0.000$ ; proactivity:  $\beta = 0.298$ ,  $SE = 0.062$ , and  $p = 0.000$ ). The technostress inhibitor also significantly predicted job satisfaction ( $\beta = 0.255$ ,  $SE = 0.048$ , and  $p = 0.000$ ). The technostress inhibitor did not predict any individual task performances. However, the R-square results suggest that fewer than 14% of the variances predicted job satisfaction and the three dimensions of individual role

**Table 3. Results from structural equation modeling**

|                               | B     | $\beta$ | S.E. | C.R.   | $p$  | $R^2$ |
|-------------------------------|-------|---------|------|--------|------|-------|
| <b>Technostress Creator</b>   |       |         |      |        |      |       |
| Individual Task Proficiency   | -.124 | -.124   | .06  | -2.062 | .039 |       |
| Individual Task Adaptivity    | .04   | .04     | .061 | .646   | .518 |       |
| Individual Task Proactivity   | .134  | .134    | .06  | 2.23   | .026 |       |
| <b>Technostress Inhibitor</b> |       |         |      |        |      |       |
| Individual Task Proficiency   | .038  | .038    | .062 | .608   | .543 |       |
| Individual Task Adaptivity    | .053  | .053    | .063 | .834   | .404 |       |
| Individual Task Proactivity   | .118  | .118    | .062 | 1.918  | .055 |       |
| <b>Job Satisfaction</b>       |       |         |      |        |      |       |
| Individual Task Proficiency   | .322  | .322    | .062 | 5.198  | ***  | .130  |
| Individual Task Adaptivity    | .291  | .291    | .063 | 4.606  | ***  | .095  |
| Individual Task Proactivity   | .298  | .298    | .062 | 4.827  | ***  | .135  |
| Technostress Creator          | -.088 | -.088   | .063 | -1.407 | .16  | .077  |
| Technostress Inhibitor        | .255  | .255    | .062 | 4.131  | ***  |       |
| T. Creator x T. Inhibitor     | .081  | .106    | .048 | 1.697  | .09  |       |



performance.

No evidence exists that the technostress inhibitor moderates the relationship between the technostress creator and job satisfaction ( $\beta = 0.106$ ,  $SE = 0.048$ , and  $p = 0.009$ ). The indirect effect resulted in the relationship between the technostress creator and all facets of individual role performance mediated by job satisfaction and moderated by the technostress inhibitor also to be not statistically significant (proficiency:  $p = 0.119$ ; adaptivity:  $p = 0.112$ ; proactivity:  $p = 0.119$ ).

## Discussion

Five hypotheses were proposed to investigate the relationship between technostress and individual role performance as mediated by job satisfaction and moderated by the technostress inhibitor. Preliminary data analyses were conducted before analyzing the data using path analysis in SEM. The results suggest that all measurements were adequate for use with all variables. For the technostress creator, six items were removed to increase the validity of the measurement. The preliminary results (confirmatory factor analysis (CFA), model fit indices, correlations, and reliabilities) also suggested that the model was appropriate for path analysis in SEM.

The data analysis results supported only the first and third hypotheses. It was evident that the technostress creator negatively predicted individual task proficiency. However, the results suggested that the technostress creator had a positive relationship with individual task adaptivity and proactivity. Therefore, the respondents in urban areas in Indonesia could be advised that ICT use only creates stress when it cannot help them work effectively (Ragu-Nathan et al., 2008; Tarafdar et al., 2015). Conversely, when employees experience difficulties using ICTs, they might then become motivated to innovate. Innovations related to the use of technology are frequent and easy (Berzin et al., 2015). Employees at any level in any field can use technology to bring innovations to their work. As a result, they might transform technostress into something useful (Hargrove et al., 2013; Tarafdar et al., 2019).

This study focuses more on individual task proactivity and notes that uncertainty in the

work environment when using ICTs, such as unstable Internet connections, unreliable software, or unsecured connections, tend to improve employees' initiative under none or less supervision from their employers (Griffin et al., 2007). Individual task proactivity is defined as the ability to change behavior or situation that enables individuals to anticipate what will happen when they do their work (Griffin et al., 2007). For example, in the context of technostress, when employees are faced with unstable Internet connections, they find another internet provider. As stated in the introduction, Indonesia's Internet speed is still unreliable, particularly its download and upload speeds (Speedtest Global Index, n.d.). Therefore, urban employees in Indonesia might find it difficult to predict and rely on their Internet connection, possibly creating threats, such as weaker security, data loss, or connectivity loss. Tarafdar et al. (2019) also pointed out that an individual could see these threats as a challenge that can motivate them to create positive behaviors to suppress their technostress. Then, this study could argue that urban employees in Indonesia are more likely to find a way to manage the circumstances and proactively find solutions for them. As a result, this study also notes the idea that urban employees in Indonesia tend to be quite capable of proactively and adaptively changing their roles to reduce the impact of technostress. However, further studies should attempt to determine whether this relationship can also be generalized in other contexts.

The path analysis results also found that the relationship between the technostress creator and individual task adaptivity was not statistically significant. Further, the data did not support the mediation (by job satisfaction) and moderation (by the technostress inhibitor) hypotheses. Although these results were supported by previous studies (Ragu-Nathan et al., 2008), this study argues that the respondents might already have developed a coping mechanism for directing the stress arising from technologies toward something positive and useful: techno eustress (Tarafdar et al., 2019). Most respondents were of the millennial generation and, thus, exposed to the expansion of technologies (Deal et al., 2010; Smola & Sutton, 2002). Therefore, they would have been more likely to develop a cognitive mechanism to adapt to the

continuous development of ICTs; thus, would not have been unduly stressed at being introduced to a new ICT. In addition, because they were able to adapt, they did not experience any stress-related situations that hindered their satisfaction with their work. Further, they had access to significant support outside the organization to find new and easier ways to use the ICTs on platforms such as YouTube, other social media, or learning resource websites.

This study finds that technology use has not created high degrees of stress for employees during the Covid-19 pandemic, possibly because most employees have prior experience using ICTs. Therefore, only minor adjustments are required to maintain individual role performance. Support from organizations was not crucial because employees could find support from other resources. However, organizations should focus on providing practical assistance, such as opportunities for employees to explore new ICTs after a proper introduction. Such assistance could be achieved by giving them proper learning materials to explore by trial and error, allowing employees to find the most efficient way to finish their work using the ICTs provided. Another practical implication of this study is that it reveals that employees might not experience technostress when they can use their ICTs properly, meaning that most individuals in this study found themselves able to use ICTs appropriately for their work. Nonetheless, most respondents were from urban areas, which offer more opportunities to learn to use technologies.

This study is not without limitations. First, although approximately 600 responses were collected, only 244 could be used. Therefore, the attempt to minimize common method variance seems inappropriate for online data collection. Future research should consider another approach that encourages respondents to answer both survey links. Second, six items had to be removed from the results of the CFA because they were lower than the 0.4 limit. In future research, these items should be revised to increase validity and reliability to ensure that the measurement will remain the same as the original intention. Finally, because people in urban areas are more likely to have an easier time accessing technologies than those in other areas, these groups, along with individuals with other differences in situations, should also be compared.

Such individual variances might increase the effects of technostress on job satisfaction and individual role performance.

## Conclusions

This study investigated how technostress has predicted individual role performance (proficiency, adaptivity, and proactivity) during the Covid-19 pandemic. The results show that the technostress creator only tended to increase stress if it disrupted individuals' work. Therefore, organizations should carefully choose the correct ICTs to help their employees complete their work. Future research should be conducted with more attention to individual difference variables for comparison purposes.

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## References

- Al-Ansari, M. A., & Alshare, K. (2019). The impact of technostress components on the employees satisfaction and perceived performance: The case of Qatar. *Journal of Global Information Management*, 27 (3), 65–86. <https://doi.org/10.4018/JGIM.2019070104>
- Ansah, S. O., Azasoo, J. Q., & Adu, I. N. (2016). Understanding the effects of techno-stress on the performance of banking staff. *International Journal of Business Continuity and Risk Management*, 6 (3), 222. <https://doi.org/10.1504/ijbcrm.2016.079010>
- Arbuckle, J. L. (2019). Amos (Version 26) [Computer Program]. IBM SPSS. <https://developer.ibm.com/predictiveanalytics/2019/04/09/whats-new-in-amos-26/>
- Bakotić, D. (2016). Relationship between job satisfaction and organisational performance. *Economic Research-Ekonomska Istrazivanja*, 29 (1), 118–130. <https://doi.org/10.1080/1331677X.2016.1163946>
- Bauwens, R., Denissen, M., Van Beurden, J., & Coun, M. (2021). Can Leaders Prevent Technology From Backfiring? Empowering Leadership as a Double-Edged Sword for Technostress in Care. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.702648>

- Berzin, S., Singer, J., & Chan, C. (2015). Practice innovation through technology in the digital age: A grand challenge for social work. *American Academy of Social Work and Social Welfare*, 1–23. <http://aaswsw.org/wp-content/uploads/2013/10/Practice-Innovation-through-Technology-in-the-Digital-Age-A-Grand-Challenge-for-Social-Work-GC-Working-Paper-No-12.pdf>
- Boichenko, O., & Tymchenko, N. (2020). How to reduce the pandemic impact on employees: A guide for company leaders. <https://www2.deloitte.com/ua/en/pages/human-capital/articles/impact-of-covid-19.html>
- Chyung, S. Y. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-Based Survey Design: The Use of a Midpoint on the Likert Scale. *Performance Improvement*, 56 (10), 15–23. <https://doi.org/10.1002/pfi.21727>
- Corporations; IBM. (2019). IBM SPSS Statistics for Windows (Version 26) [Computer program]. IBM Corp. <https://www.ibm.com/products/spss-statistics?lnk=ushpv18ct7>
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16 (3), 297–334. <https://doi.org/10.1007/BF02310555>
- Deal, J. J., Altman, D. G., & Rogelberg, S. G. (2010). Millennials at work: What we know and what we need to do (if anything). *Journal of Business and Psychology*, 25 (2), 191–199. <https://doi.org/10.1007/s10869-010-9177-2>
- Garfin, D. R. (2020). Technology as a coping tool during the coronavirus disease 2019 (COVID-19) pandemic: Implications and recommendations. *Stress and Health*, 36 (4), 555–559. <https://doi.org/10.1002/smi.2975>
- Griffin, M. A., Neal, A., & Parker, S. K. (2007). A new model of work role performance: Positive behavior in uncertain and interdependent contexts. *Academy of Management Journal*, 50 (2), 327–347. <https://doi.org/10.5465/AMJ.2007.24634438>
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: test of a theory. *Organizational Behavior and Human Performance*, 16 (2), 250–279. [https://doi.org/10.1016/0030-5073\(76\)90016-7](https://doi.org/10.1016/0030-5073(76)90016-7)
- Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2018). *Multivariate data analysis* (8th ed.). Cengage Learning.
- Hargrove, M. B., Nelson, D. L., & Cooper, C. L. (2013). Generating eustress by challenging employees. *Helping people savor their work. Organizational Dynamics*, 42 (1), 61–69. <https://doi.org/10.1016/j.orgdyn.2012.12.008>
- Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*, 6 (1), 53–60. <https://doi.org/10.21427/D79B73>
- Jena, R. K. (2015). Impact of Technostress on Job Satisfaction: An Empirical Study among Indian Academician. *The International Technology Management Review*, 5 (3), 117. <https://doi.org/10.2991/itm.2015.5.3.1>
- Johns, R. (2005). One Size Doesn't Fit All: Selecting Response Scales For Attitude Items. *Journal of Elections, Public Opinion & Parties*, 15 (2), 237–264. <https://doi.org/10.1080/13689880500178849>
- Kingma, S. (2019). New ways of working (NWW): work space and cultural change in virtualizing organizations. *Culture and Organization*, 25 (5), 383–406. <https://doi.org/10.1080/14759551.2018.1427747>
- Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). The Guildford Press.
- Kung, F. Y. H., Kwok, N., & Brown, D. J. (2018). Are Attention Check Questions a Threat to Scale Validity? *Applied Psychology: An International Review*, 67 (2), 264–283. <https://doi.org/10.1111/apps.12108>
- Laberge, L., O'toole, C., Schneider, J., & Smaje, K. (2020). How COVID-19 has pushed companies over the technology tipping point—and transformed business forever. McKinsey & Company. <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and Coping*. Springer.
- Leong, C. T., & Rasli, A. (2014). The Relationship between Innovative Work Behavior on Work

- Role Performance: An Empirical Study. *Procedia - Social and Behavioral Sciences*, 129, 592–600. <https://doi.org/10.1016/j.sbspro.2014.03.717>
- Locke, E. A. (1976). The nature and causes of job satisfaction. In *Handbook of Industrial and Organizational Psychology* (pp. 1297–1349). Rand McNally.
- McDonald, R. P. (1999). *Test theory: A unified treatment*. Lawrence Erlbaum.
- Moegiarso, S. (2021). PPKM Mikro menjadi langkah lanjutan untuk menekan kasus positif dalam pengendalian Covid-19. <https://www.ekon.go.id/publikasi/detail/1224/ppkm-mikro-menjadi-langkah-lanjutan-untuk-menekan-kasus-positif-dalam-pengendalian-covid-19>
- Neal, A., Yeo, G., Koy, A., & Xiao, T. (2012). Predicting the form and direction of work role performance from the Big 5 model of personality traits. *Journal of Organizational Behavior*, 33 (2), 175–192. <https://doi.org/10.1002/job.742>
- Pembatasan Sosial Berskala Besar. (2020). Kemenko PMK. <https://www.kemendikbud.go.id/pembatasan-sosial-berskala-besar>
- Pennaforte, A. (2016). The influence of proactive socialization behaviors and team socialization on individual performance in the team. *Asia-Pacific Journal of Cooperative Education*, 17 (4), 413–421.
- Pituch, K. A., & Stevens, J. P. (2016). *Applied Multivariate Statistics for the Social Sciences* (6th ed.). Routledge.
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63, 539–569. <https://doi.org/10.1146/annurev-psych-120710-100452>
- Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. (2008). The consequences of technostress for end users in organizations: Conceptual development and validation. *Information Systems Research*, 19 (4), 417–433. <https://doi.org/10.1287/isre.1070.0165>
- Sheraz, A., Wajid, M., Sajid, M., Qureshi, W. H., & Rizwan, M. (2014). Antecedents of Job Stress and its impact on employee's Job Satisfaction and Turnover Intentions. *International Journal of Learning and Development*, 4 (2). <https://doi.org/10.5296/ijld.v4i2.6098>
- Smola, K. W., & Sutton, C. D. (2002). Generational differences: Revisiting generational work values for the new millennium. *Journal of Organizational Behavior*, 23(SPEC. ISS.), 363–382. <https://doi.org/10.1002/job.147>
- Song, Y., & Gao, J. (2020). Does Telework Stress Employees Out? A Study on Working at Home and Subjective Well-Being for Wage/Salary Workers. *Journal of Happiness Studies*, 21 (7), 2649–2668. <https://doi.org/10.1007/s10902-019-00196-6>
- Sousa, V. D., & Rojjanasrirat, W. (2011). Translation, adaptation, and validation of instruments or scales for use in cross-cultural health care research: A clear and user-friendly guideline. *Journal of Evaluation in Clinical Practice*, 17, 268–274. <https://doi.org/10.1111/j.1365-2753.2010.01434.x>
- Spagnoli, P., Molino, M., Molinaro, D., Giancaspro, M. L., Manuti, A., & Ghislieri, C. (2020). Workaholism and Technostress During the COVID-19 Emergency: The Crucial Role of the Leaders on Remote Working. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.620310>
- Speedtest Global Index. (n.d.). <https://www.speedtest.net/global-index>
- SurveyMonkey. (2020). Survey Monkey [Computer software]. SurveyMonkey Inc. [www.surveymonkey.com](http://www.surveymonkey.com)
- Tarafdar, M., Cooper, C. L., & Stich, J. F. (2019). The technostress trifecta - techno eustress, techno distress, and design: Theoretical directions and an agenda for research. *Information Systems Journal*, 29 (1), 6–42. <https://doi.org/10.1111/isj.12169>
- Tarafdar, M., Pullins, E. B., & Ragu-Nathan, T. S. (2015). Technostress: Negative effect on performance and possible mitigations. *Information Systems Journal*, 25 (2), 103–132. <https://doi.org/10.1111/isj.12042>
- World Health Organization. (2020). Local epidemiology should guide focused action in “new normal” COVID-19 world. World Health Organization. <https://www.who.int/southeastasia/news/detail/15-05-2020-local-epidemiology-should-guide-focused-action-in-new-normal-covid-19-world>