# Technology Use Predicting Health Complaints Through Family Support

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## INTRODUCTION

- Recently a large base of literature has emerged regarding technology and its relationship to physical and psychological well-being.
- For example, qualitative research on adolescents has suggested that the relationship between technology use and well-being is multidimensional with four emerging themes (Favotto, Michaelson, & Davison, 2017).
    - One such theme, physical activity, has both positive and negative implications as it can be used to track physical activity and increase time being sedentary.
- Furthermore, the use of technology devices (such as cellphones and computers) decreased with the presence of physical ailments (such as arthritis) among older adults (Vorrink, 2017).
    - These findings suggest technology can play a strong role in physical well-being.
- Similarly, social support has been found to strongly protect against negative physical and emotional well-being (Melchiorre, 2017).
    - Among adolescents, both parental and teacher support predicted decreases in psychosomatic health complaints.
- Decreases in gross domestic product (GDP), however, has been associated with decreases in perceived health across Europe (Axelrad, 2017).
    - Additionally, the association between emotions and health have been found globally with low GDP countries having a stronger correlation (Pressman, 2013).
    - GDP has also shown strong associations with technology use in the home, private business, and public sectors (Kottemann & Boyer-Wright, 2009).

### Present Study

- We anticipated that technology use would predict health complaints while family support would mediate this relationship.
- Additionally, we expected that the relationship would be stronger in nations with a higher gross domestic product (GDP).
- These hypotheses were tested using structural equation modeling and tests of invariance.

### METHOD

- **Participants**
    - Data were utilized from the Health Behaviors in School-Aged Children (HBSC; 2014) public use dataset.
    - HBSC contains data on a wide range of topics from school-aged children around the world.
        - The current study utilizes data from children living in three nations. National gross domestic product rank (GDP-R) was assessed based the World Bank's (2019) ranking system.
            - Germany (N = 5,077; M-age = 13.58, SD-age = 1.64; men 50.4%; women = 49.6%; GDP-R = 4)
            - Slovakia (N = 4,215; M-age = 13.67, SD-age = 1.62; men 47.8%; women = 52.2%; GDP-R = 69)
            - The Republic of Moldova (N = 4,437; M-age = 13.58, SD-age = 1.65; men = 50.4%; women = 49.6%; GRP-R = 126).
- **Procedures and Measures**
    - Participants completed surveys that pertained to variables such as technology use, family support, and health complaints (see table 1).
- **Data Analysis**
    - Demographic and reliability analyses were conducted in IBM SPSS version 27.
    - IBM Amos was used to conduct a series of structural equation models examining the mediating ability of family support on the relationship between technology use and health complaints.

## Results

Table 1.
Information for items used.

| Variable | Example Item | Higher Scores Indicate | Alpha |
|---|---|---|---|
| Technology Use (6 items) | *How many hours [on weekdays], in your free time, do you usually spend watching TV, videos (including YouTube or similar services), DVDs, and other entertainment on a screen?* | Higher rates of technology use | .841 |
| Family Support (8 items) | *In my family: I think the important things are talked about* | Higher levels of familial support | .855 |
| Health Complaints (8 items) | *In the last 6 months: how often have you had the following….? A. Headache* | Higher occurrence of health complaints | .827 |

- **Full Model Fit:**
    - $\chi^2$ (196) = 24467.301, $p$ < .001; GFI = .889; CFI = .839; RMSEA = .095.
- **Germany Model Fit:**
    - $\chi^2$ (196) = 9264.706, $p$ < .001; GFI = .890; CFI = .836; RMSEA = .095.
- **Slovakia Model Fit:**
    - $\chi^2$ (196) = 8261.253, $p$ < .001; GFI = .864; CFI = .856; RMSEA = .099.
- **Republic of Moldova Model Fit:**
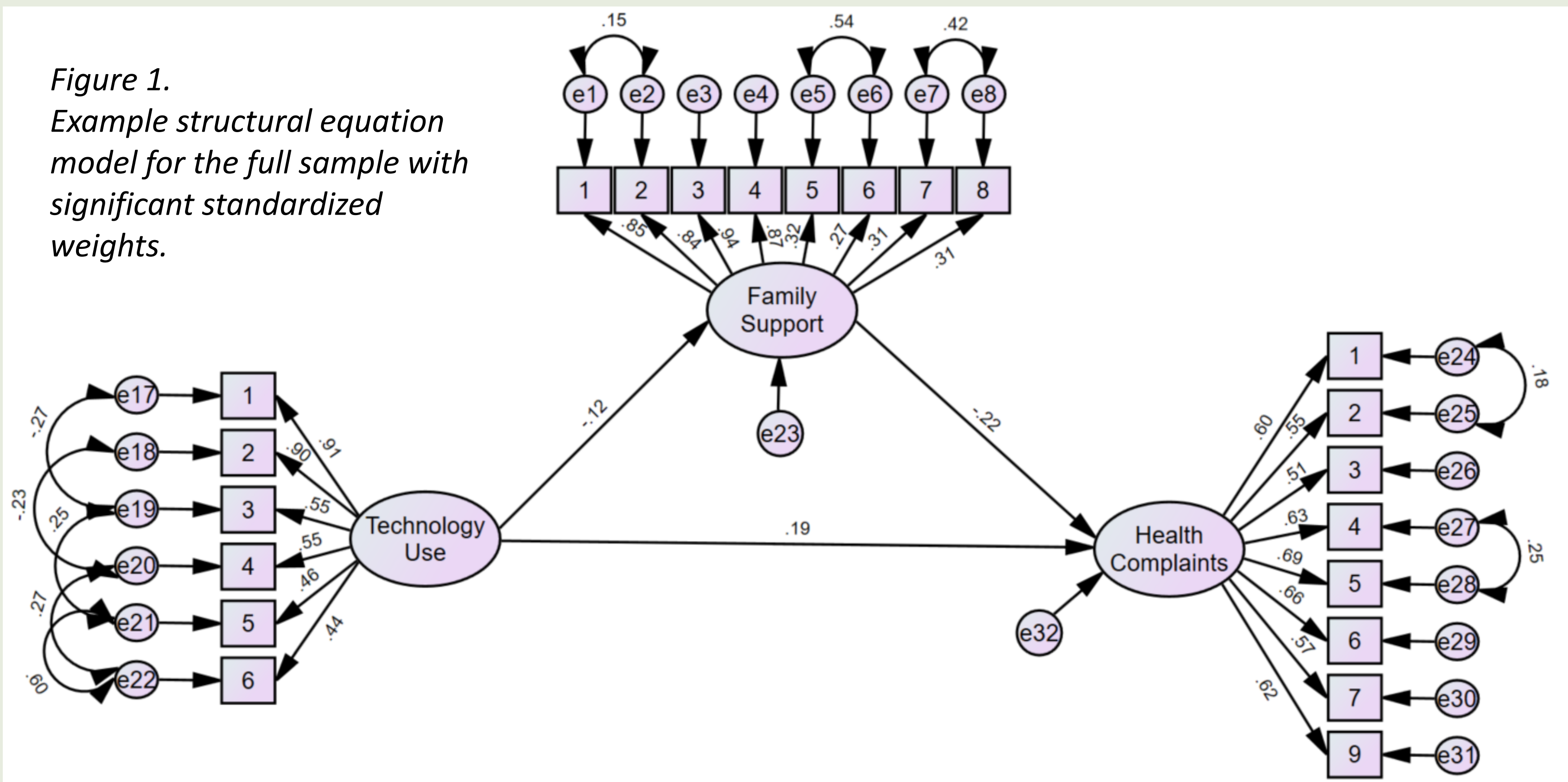    - $\chi^2$ (196) = 7262.393, $p$ < .001; GFI = .895; CFI = .839; RMSEA = .090.



Figure 1.
Example structural equation model for the full sample with significant standardized weights.

Table 2.
Standardized regression weight and mediation results for each structural equation model.

| IV (n) | Full Model IV → M | Full Model M → DV | Full Model IV → DV | Un-mediated IV → DV | Freedman-Schatzkin (df) | Aroian | % Mediated |
|---|---|---|---|---|---|---|---|
| Full (13,729) | -0.122*** | -0.219*** | 0.194*** | 0.221*** | 21.038 (13,727)*** | 10.947*** | 12.09% |
| Germany (5,077) | -0.174*** | -0.333*** | 0.166*** | 0.224*** | 17.898 (5,075)*** | 9.971*** | 25.87% |
| Slovakia (4,215) | -0.105*** | -0.161*** | 0.230*** | 0.247*** | 8.450 (4,213)*** | 5.443*** | 6.84% |
| Moldova (4,437) | -0.08*** | -0.192*** | 0.157*** | 0.173*** | 10.825 (4,435)*** | 4.466*** | 8.88% |

Note. *p > .05; **p >.01; ***p > .001

## Results Continued

- **Invariance Analysis**
    - When assuming the unconstrained model is correct, high levels of misfit were found, suggesting the models differ significantly.
        - Measurement model: $\chi^2$ (38) = 1781.318, p < .001; NFI = .011; TLI = .001.
        - Structural Model: $\chi^2$ (44) = 1880.596, p < .001; NFI = .012; TLI = .000.

## Discussion

- In the full model, family support significantly mediated the relationship between technology use and health complaints.
- Results showed that increased technology use was related to an increase in health complaints and decrease in family support. In addition, the more family support that children reported, the less health complaints they were likely to indicate.
    - Students who spent more time using technology (e.g., TV, videos, etc.) were less likely to have a strong family support which led to an increase of health complaints.
- Invariance analysis indicated a significant variance among the countries of the structural model.
    - Germany showed the strongest mediation effect of the family support while Slovakia showed the weakest mediation effect among the three countries.
    - Variation among the countries might be related to differing levels of GDP, which can affect the amount of technology use at home (Kottemann & Boyer-Wright, 2009). As more students are likely to use technology across many sectors of life, the role of family support becomes more substantial with the countries under examination.

## Limitations and Future Directions

- Longitudinal methods within the three nations may provide further insight into the relationships presented here. In doing so, future studies can expand the target population to adults who are also likely to show various effects of technology use and family support on health complaints.
- Findings from the present study suggest that increasing quality family time and support can be associated with positive outcomes such as a decrease in health complaints. Future studies can look into other potential positive impacts of family support on areas such as academic attitudes and success.

## Conclusion

- The study showed that students who had more family support are less likely to use technology often and less likely to report health complaints.
- The results showed that there was a variation in the effect of family support between three European countries. Germany was the most affected by the mediating role of family support while Slovakia was the least affected.

## Contact Information