TPM®

EDITORIAL

Social sciences' literature, including psychological literature, is increasingly aware of the importance of using a multilevel approach from a conceptual, methodological and statistical point of view, as demonstrated by some commentary or invited forum, including some recent ones (Oswald & Tackett, 2020; Vandenberg, 2020). From a conceptual point of view, multilevel approach conceives psychosocial processes as a possible outcome of at least two levels' predictor(s), which can also interact. From a methodological point of view, multilevel approach allows analyzing data produced in research, taking into account the complexities inherent in different research designs: cross-sectional (Christ, Sibley, & Wagner, 2019), experimental (Judd, Westfall, & Kenny, 2017), longitudinal (Schoemann, Rhemtulla, & Little, 2014), dyadic (Kenny & Kashy, 2011). From a statistical point of view, multilevel analyses allow disentangling score's variance in within and between variances, that is variance due to Level 1 and variance due to clusters to which Level 1's elements belong, thus improving the interpretation of the results.

In this special issue, we collected papers which illustrate some applications of multilevel data analysis in developmental, social, community, and work psychology. More specifically, within developmental psychology framework, Cook, Wood, Scott, Pierce, Kapadia, and Halkitis conducted a longitudinal design with 14 data collection points, investigating how sexual minorities change in their alcohol and marijuana use during the emerging adulthood period. Authors applied specific data analyses (they looked for different classes of substance use trajectories using both censored normal and zero-inflated Poisson distributions) in order to analyze behavior (such as substance use) that sometimes follows a nonnormal distribution. With regard to the area of social psychology, Gatti and Procentese focused on social media uses and considered neighborhood as a meaningful clustering level, especially within community psychology. However, they found a low level of nonindependence within neighborhood clusters and provided discussion about possible interpretation of that finding. Then, within social and relational psychology, Theodorou, Livi, and Alessandri proposed an application of actor-partner interdependence mediation model (APIMeM) using multilevel modeling within a dyadic design, finding that both actor and partner's positivity significantly predicted satisfaction with the relationship, also through the actor's perception of partner's positivity. The last paper that used multilevel analyses in order to answer to an applicative research question was proposed by Brondino, Bazzoli, and Pasini, who applied a multilevel mediation analysis to investigate the effect that leader-member exchange has on safety climate agreement and safety behavior. Authors underlined the importance of reflecting on multilevel constructs, thus analyzing them through multilevel

confirmatory factor analysis (MCFA) and computing agreement between two interdependent observation through latent congruence analysis. The importance of reflecting on measurement and on its possible multilevel features was also the focus of Tagliabue, Sorgente, and Lanz's paper: it revealed possible implicit assumptions regarding ontology and reliability of multilevel constructs. In particular, authors presented a tutorial of seven-steps useful as a guide for researchers to test those assumptions within multilevel confirmatory factor analysis framework.

All those papers demonstrated that multilevel approach is consolidated and also that each research question and design ask for specific multilevel data analyses and statistical adaptions. In any case, this special issue also shows how the liveliness in the multilevel literature is very high. In fact, the last four papers of the special issue proposed new models or statistical strategies within the multilevel framework, inviting to open our research to some lesser known aspects of those techniques.

For instance, Folberg, Brauer, Ryan, and Hunt, illustrated the two crossed random effects (participants and attributes) experimental design applying linear mixed-effects models (LMEMs) to research on gender stereotyping, also explaining how to analyze data characterized by planned missingness. Gistelinck and Loeys merged the challenges of dyadic and longitudinal designs proposing to apply a multilevel autoregressive model extension of the actor-partner interdependence model (APIM). In the paper, authors explained how to use their user-friendly app in order to estimate the lagged dependent APIM, a model in which a lagged dependent variable is included, that is the outcome score of the previous time point, in order to capture the state-dependency. Li and Rhoads reflected on multilevel sample selection and on its effect on generalizing treatment effect estimates to a target population. Authors conducted a simulation in order to analyze possible bias, finding that methods including both student and school probability of participation (IPP) reduce bias more. Finally, Kelcey, Bai, Xie, and Cox proposed extensions to Croon-based estimator for multilevel structural equation models useful for incorporating micro-macro effects within the better known macro-micro effects, especially in small to moderate sized studies. Authors showed strength and weakness of Croon's bias-corrected method against maximum likelihood and uncorrected factor score path analysis.

Overall, this special issue shows how the multilevel framework helps researchers not only to better answer research questions, but also to have a vision of the psychological processes more suited to the specific characteristics of those processes. Furthermore, advanced models presented in this special issue help solving methodological problems, characteristic of the discipline, such as small and not always representative samples, complex research designs with different levels of nonindependence in the data, constructs conceptualized at different levels and measured through different informants, and so on. Just recently, some reflections within philosophy of science highlighted the importance of multilevel approach for psychological discipline (Fang, 2020), thus our hope is that this special issue will give rise to new research questions and approaches that will further support the explanatory

capacity of the discipline. Moreover, we hope that multilevel approach will be considered in other areas of psychology and social sciences, besides the ones represented in this special issue.

Christ, O., Sibley, C. G., & Wagner, U. (2019). Multilevel Modeling in Personality and Social Psychology. In K. Deaux & M. Snyder (Eds.), ***The Oxford handbook of personality and social psychology*** **(pp. 239-260). New York, NY: Oxford University Press.**

Fang, W. (2020). Multilevel modeling and the explanatory autonomy of psychology. ***Philosophy of the Social Sciences***, ***50***(3), 175-194. doi:10.1177/0048393120917633

Judd, C. M., Westfall, J., & Kenny, D. A. (2017). Experiments with more than one random factor: Designs, analytic models, and statistical power. ***Annual Review of Psychology***, ***68***, 601-625. doi:10.1146/annurev-psych-122414-033702

Kenny, D. A., & Kashy, D. A. (2011). Dyadic data analysis using multilevel modeling. In J. Hox & J. K. Roberts (Eds.), ***Handbook of advanced multilevel analysis*** **(pp. 335-370). New York, NY: Routledge.**

Oswald, F. L., & Tackett, J. L. (2020). Multilevel modeling and meta-analysis: Epilogue to the invited forums. ***Association for Psychological Science***, ***3***(1), 138-140. doi:10.1177/2515245920905783

Schoemann, A. M., Rhemtulla, M., & Little, T. D. (2014). Multilevel and longitudinal modeling. In H. T. Reis & C. M. Judd (Eds.), ***Handbook of research methods in social and personality psychology*** **(pp. 571-588). Cambridge, UK: Cambridge University Press.**

Vandenberg, R. J. (2020). Multilevel models in international business research: A commentary. In L. Eden, B. B. Nielsen, & A. Verbeke (Eds.), ***Research methods in international business*** **(pp. 433-438). London, UK: Palgrave Macmillan, Cham.**