Relationship Between Supply Chain Management and Competitor Intensity in The Food Business: A Structural Equation Model

Karen Earnshaw[1]
[1]University of Alberta, Alberta, Canada
*Corresponding Author: Karenr@nrcan.gc.ca

ABSTRACT
Supply Chain Management (S.C.M.) was developed as a system and coordination of strategies of business functions that manage supply chains to improve long-term performance. This study aims to analyze the relationship between the implementation of supply chain management and the intensity of competitors in the food business, analyze the relationship of competitor intensity to company performance, and provide recommendations on the Food and beverage business related to increasing competitiveness based on the implementation of supply chain management. The results showed that the implementation of supply chain management on competitor intensity has a significant relationship with an influence of 44.5%, and the relationship of competitor intensity to company performance is a meaningful relationship with a power of 65.2%. From the recommendations, food business people and innovative products are recommended to expand and cover the entire market by considering aspects of logistics distribution, digital marketing, and product gallery development.

Keywords: Food Business, Supply Chain Management, Structural Equation Model

INTRODUCTION

Food business growth causes intense competition between business people; business growth not accompanied by good ability or performance can cause a business to be unable to survive amid tight competition (Albahri, 2021). To sustain the company, it is necessary to improve performance and increase management, finance, and professionalism capacity (F. Li, 2020). Because the good and bad conditions of a company are seen from the performance that the company has achieved (Torresin, 2022). Performance is the effectiveness and efficiency of the efforts made by the organization in achieving organizational goals. Performance measurement is data analysis and control for businesses (Sang, 2021).

To survive in a business owned by business actors, they must have a competitive advantage. The company is expected to survive and further develop in the global competitive market by having an excellent competitive advantage (Javid, 2021). A company can use various strategies to compete superior in international competition. Since 1990, it began to be known as a competitive strategy by getting the right products and services at the right time and place at the lowest cost (Modaresnezhad, 2021). However, companies now realize that this alone is insufficient to improve efficiency; their supply chain system must be even more competitive (Luan, 2020). Supply chain management is developed as a system and coordination of strategies from traditional business functions, which is a tactic of all businesses in an organization and all companies in the supply chain to improve the long-term performance of individual organizations and supply chains (Xi, 2020)(Katz, 2020).

The importance of synergizing with suppliers, manufacturers, distributors, retailers, and customers to create quality, cheap, and fast products (Wang, 2021). This concept later gave birth to Supply Chain Management. Supply chain management, better known as supply chain management, emphasizes networks with an integrated pattern starting from product flow from suppliers, manufacturers, and retailers to the end consumer (Jobst, 2021). The goal of supply chain management is to coordinate activities in the supply chain to maximize the competitive advantage and benefits of the supply chain for the end consumer (Núñez-Barriopedro, 2021) (Soltanpour, 2020).

The implementation of S.C.M. has occurred a lot, for example, such as involving suppliers as partners in the process of providing raw materials, maintaining good relations with consumers to provide service

satisfaction to consumers, and managing information related to product development both to suppliers and consumers, and competitive strategies to meet operational quality standards by providing product quality assurance by the market (Useche, 2021). Supply chain management that is not implemented correctly can impact product quality and the price of goods produced (Zhai, 2020).

The problem of S.C.M. implementation starts from the lack of information about specific suppliers of food products. Many business actors are just beginning to pioneer, so information about suitable suppliers remains in the livelihood period (Jeffries, 2020). There is no uniformity in prices because they use different suppliers, so less competitive prices make businesses lose the market and eventually not sell (Kiraz, 2020). Companies have not fully used information technology, and uncertain communication of raw material supply can cause price increases because the raw materials obtained will be challenging (Santos, 2023). Poor implementation of S.C.M. causes business actors to risk less profit and efficiency in raw material supply operations. The distribution of supplies and logistics must be arranged in such a way that is appropriate for productivity efficiency. Errors in determining the investment amount in raw material inventories will suppress food business profits (Song, 2022).

Identifying with the structural equation modelling method is needed to prove the sustainability of company performance related to the implementation of S.C.M. and tight competition (Jin, 2021). Structural Equation Modeling (S.E.M.) is a multivariate analysis method that can be used to describe the simultaneous linear relationship between observational variables (indicators) and variables that cannot be measured directly (latent variables) (Lyu, 2020). Latent variables are directly unobserved or unmeasurable but must be measured through several hands. The implementation of S.C.M., in this case, is estimated as one of the indicators that can indirectly affect the company's performance (Tekce, 2020). At the same time, the intensity of competitors mediates the influence of both into indicators that do not directly affect these two variables. So that complex relationships between variables can be seen with the S.E.M. method (Mai, 2021).

METHODS

The purposive sampling method is a way of selecting samples according to the wishes and needs of researchers to determine samples. The samples in this study are from 10 food companies in the Toronto area (Rappaport, 2020)(Michels, 2021).

Data Analysis
Model Conceptualization

This research was conducted to identify problems in S.C.M., business organization performance, and the intensity of similar business competitors, as well as to identify variables that affect business performance (X. Yang, 2022). This variable serves to prepare the Structural Equation Modeling (S.E.M.) model. This variable is determined based on the researcher's recommendations from several references that have been obtained (Shi, 2020).

Designing Structural Models

The flowchart created based on the theoretical model built in the first stage will be depicted in a flowchart, making it easier to see the causality relationship you want to test (Romero-Rodriguez, 2020). In a flowchart, the relationships between constructs will be expressed through arrows. A straight arrow indicates a direct causal relationship between one construct and another (C. H. Li, 2021).

Structural Model Evaluation

Evaluation of outer models with reflexive indicators is assessed through convergent validity and discriminant validity. (Yin, 2021) explained that convergent validity is the extent to which a specific variable's measurement items converge (Kang, 2021). In general, convergent validity is the extent to which certain variable measurement items combine (Sánchez, 2021). In the concurrent validity assessment, four criteria must be considered: items are declared valid when outer loading > 0.7, and data is said to be reliable or reliable when Cronbach's alpha> 0.7; composite reliability> 0.7; average extracted variance (AVE) > 0.5 (D. Yang, 2021).

Discriminant validity indicates the uniqueness of a construct from other constructs (Danks, 2020). Discriminant validity measurements were carried out using the Fornell-Larcker criterion method and cross-loading (Khan, 2021). A latent variable shares more variance with the underlying indicator than any other latent

variable. This can be interpreted as the unique value in question, which is the value of a variable hand or item greater than its latent variable compared to other latent variables (Aksoy, 2020).

Evaluation of structural models or inner models aims to predict relationships between latent variables. Changes in R-squared values can be used to explain substantive or most basic effects model estimation. In estimating the model, data input is collected from questionnaires given to business people and edited by coding the primary data collected (Saborío-Montero, 2020). The model estimation is carried out by testing validity and reliability first to ensure the data inputted is valid (Asparouhov, 2021).

Evaluation Of Goodness Of Fit Criteria

At this stage, model suitability is tested by reviewing various goodness of fit criteria. Here are some conformity indices and cut-off values to test whether a model is acceptable or rejected.

Table 1 Review of Various Goodness

R2	Information	Q2	Information
0.19-0.33	Weak	0.02-0.15	Weak
0.33-0.67	Keep	0.15-0.35	Keep
> 0.67	Strong	> 0.35	Strong

Results of hypothesis testing

Hypothesis testing gets output to prove the relationship between exogenous and endogenous variables, namely the implementation of S.C.M. and the intensity of competitors on the performance of food and beverage, thus providing recommendations to improve competitiveness in their organizational management (Cho, 2020; Shahzad, 2020; Zhou, 2020). Significance tests to predict the presence of causality relationships are carried out. P.L.S. Hypothesis Testing does not assume normally distributed data; instead, it relies on non-parametric bootstrapping procedures to test the significance of its coefficients (Dijk, 2020; Peugh, 2020; Smid, 2020).

Based on the data processing done by bootstrapping, the results can be used to answer the hypothesis in this study (Barillari, 2021; Gracia, 2020; McNeish, 2020). The results of the hypothesis test in this study can be seen through the value of T Statistics and P Values. The research hypothesis can be accepted if it has a T statistic > 1.96 and P values < 0.05. Then, it can be interpreted that exogenous variables affect endogenous variables and vice versa.

RESULTS

Convergent Validity

Convergent validity is the degree to which certain variable measurement items are fused. In the concurrent validity assessment, four criteria must be considered: items are declared valid when outer loading > 0.7, and data is said to be reliable or reliable when Cronbach's alpha > 0.7; composite reliability > 0.7; average extracted variance (AVE) > 0.5. The results of concurrent validity analysis can be seen in Table 2.

Table 2 Results of Convergent Validity Analysis

Variable	Items	Outer Loading	Cronbach's Alpha	Composite Reliability	AVE
Supply Chain Management Implementation	ISCM1	0.733	0.880	0.913	0.677
	ISCM2	0.759			
	ISCM3	0.868			
	ISCM5	0.715			
	ISCM6	0.800			
Competitor Intensity	IP1	0.783	0.848	0.892	0.624
	IP2	0.820			
	IP3	0.758			
	IP4	0.855			

	IP5	0.893			
	KP1	0.829			
	KP2	0.885			
	KP3	0.897			
	KP4	0.911			
Company Performance	KP5	0.873	0.952	0.959	0.724
	KP6	0.769			
	KP7	0.707			
	KP8	0.894			
	KP9	0.874			

Table 1 shows that all statement items on the variables Supply Chain Management Implementation, company performance, and competitor intensity have outer loading > 0.7. The AVE value of Supply Chain Management Implementation is 0.677 or > 0.5, indicating that the measurement variance is categorized into latent variables. The value of composite reliability of Supply Chain Management Implementation is 0.913, or > 0.7, and Cronbach's alpha is 0.880 or > 0.7, where according to the value of composite reliability and Cronbach's alpha is good > 0.7 means that the value of each item of behavioral intention is quite reliable and the data is relatively consistent.

The competitor's AVE intensity value of 0.624 is > 0.5, indicating that the variance of the measurement is categorized into latent variables. The composite reliability value of competitor intensity is 0.892,> 0.7, and Cronbach's alpha is 0.848,> 0.7. The value of composite reliability and Cronbach's alpha is good > 0.7, meaning that the value of each competitor intensity item is quite reliable, and the data is relatively consistent.

The outer loading value of each company performance item is> 0.7, and the AVE value of company performance 0.724 is > 0.5. This indicates that the measurement variance is categorized into latent variables. The value of composite reliability of company performance is 0.959, which is > 0.7, and Cronbach's alpha is 0.952, which is > 0.7, where the value of composite reliability and Cronbach's alpha is good > 0.7, meaning that the value of each item of company performance is quite reliable and the data is relatively consistent.

Discriminant Validity

The discriminant validity of the Fornell Larcker Criterion method appears that the value of the correlation score of each variable to the latent variable is greater than the correlation of the variable to other latent variables, so it can be concluded that the latent variable predicts the value of the variable better than the other variables. This shows that this study has fulfilled the rule of thumb of the required Fornell Larcker Criterion value.

Table 3 Discriminant Validity with Fornell Larcker Criterion Method

Variable	Supply Chain Management Implementation	Competitor Intensity	Company Performance
Supply Chain Management Implementation	**0.790**		
Competitor Intensity	0.667	**0.823**	
Company Performance	0.589	0.808	**0.851**

Bootstrapping

The hypothesis test results in this study used smart P.L.S. software version 3.2.8. The S.M.A. by bootstrapping can be seen through the T Statistics and P Values value. The research hypothesis can be accepted if it has a statistical T value of > 1.96 and a P value of < 0.05. The results of the Structural Model Assessment analysis can be seen in Figure 1.
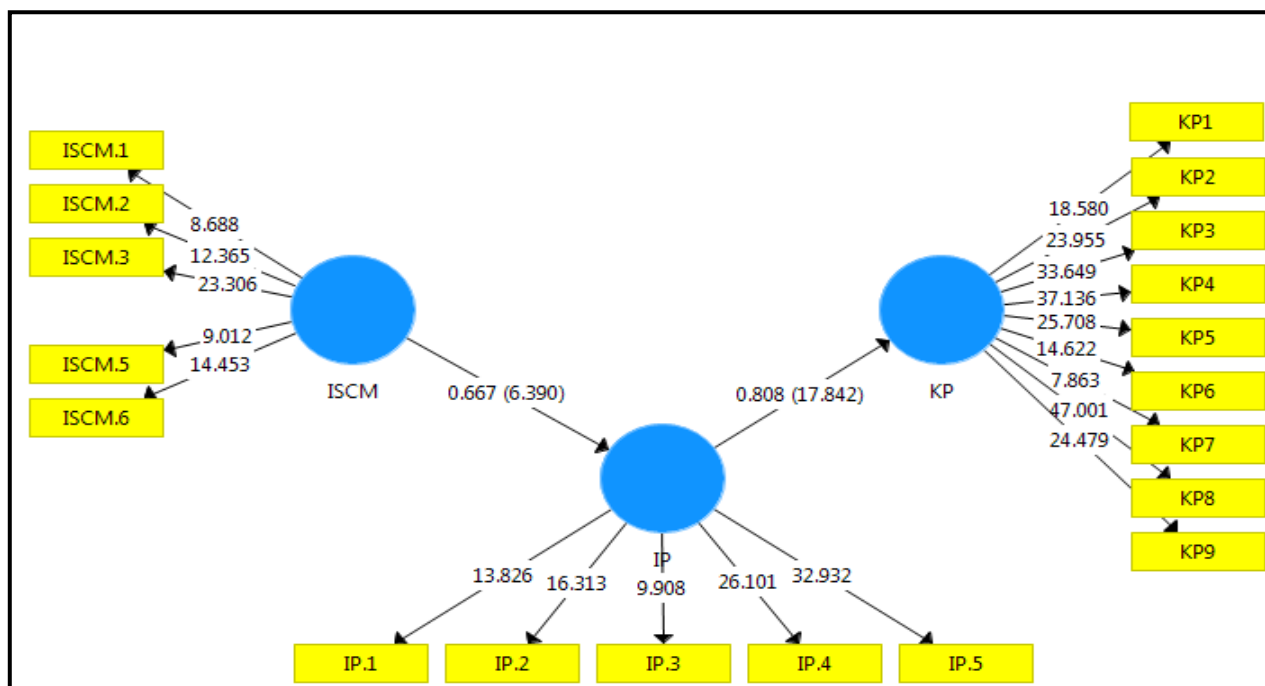
Figure 1 Structural Model Assessment

DISCUSSION

The relationship between supply chain management implementation and competitor intensity seen by (Pavlov, 2021), the structural equation modeling partial least square (SEM-PLS) method can be seen from the statistical t value of 17.842 > 1.96 and P values 0.00 < 0.05, which means the relationship of Supply Chain Management Implementation to competitor intensity is a significant relationship with an influence of 44.5% and is included in the medium category. This is by research conducted by (Banjongrewadee, 2020), which shows a significant influence between the application of S.C.M. and the intensity of competitors.

This study shows that the strength of the relationship between supply chain management implementation variables and competitor intensity is in the medium category. The data testing results show that the most significant form of S.C.M. application in the implementation of supply chain management is a business that generally runs to find out market desires in the future. In contrast, the lowest S.C.M. application is a business that tends to share information with business partners for business progress (Pulido-Martos, 2020). Meanwhile, when viewed from the intensity of competitors, the most significant competitor intensity factor is the number of business people who feel intense competition between similar business actors. This can be seen from the value of the outer model. This is by (Baloran, 2021), who found that strategic business development will be disrupted by the tight number of similar business competitors, so food and beverage business people must have a good management strategy. Furthermore, the application of S.C.M. that affects the least competitor intensity is business-oriented to customer satisfaction, This is because customers who are satisfied with food and beverage products from other companies will not be easily influenced by similar businesses offered.

The relationship of competitor intensity to the business performance seen by the structural equation modeling partial least square (SEM-PLS) method can be seen from the statistical t value of 6.390 > 1.96 and P values 0.00 < 0.05, which means that the relationship of competitor intensity to company performance is a significant relationship with an influence of 65.2% and is included in the strong category. The higher the power of competitors, the better the company's performance. The results of this study align with previous research conducted by (Al-Adwan, 2021) with the results of their research, which showed that intensive business competition as a whole had a significant effect on company performance.

Intense competition between similar business actors influenced the intensity of competitors in this study. This result can be proven by the low IP5 score associated with the standard S.C.M. dimension in the ISCM1 item, namely with the application of S.C.M. that is less customer satisfaction oriented related to the tight competition felt by business people. In addition, the performance of companies with low scores on the

competitor intensity dimension is on IP3 items, namely, business people think the occurrence of fierce competition in getting customers. From this model, it can be seen that the intense competition felt by business actors will encourage business actors to improve their business by always finding out what the market wants in the future (ISCM3) to improve performance. The results of this study are from previous research conducted by (Salehi, 2020), which showed that competitor intensity could mediate supply chain management on company performance in the food business. So, from the analysis, it can be said that what affects the company's performance is the implementation of S.C.M. and the intensity of competitors. Company performance is an assessment of achieving company targets and goals within a certain period. So good company performance will not be achieved if there is no reasonable relationship with suppliers and consumers and maintain competitive advantage in a company.

CONCLUSION

The first hypothesis is accepted, evidenced by having a statistical T value of 17.842 > 1.96 and a P value of 0.00 < 0.05, which means that the relationship of Supply Chain Management Implementation to competitor intensity is a significant relationship with an influence of 44.5% and is included in the medium category. The second hypothesis is accepted, evidenced by having a statistical T value of 6.390 > 1.96 and P values of 0.00 < 0.05, which means that the relationship of competitor intensity to company performance is a significant relationship with an influence of 65.2% and is included in the strong category.

REFERENCES

Aksoy, F. (2020). Evaluation of sustainable happiness with Sustainable Development Goals: Structural equation model approach. In *Sustainable Development* (Vol. 28, Issue 1, pp. 385–392). https://doi.org/10.1002/sd.1985

Al-Adwan, A. S. (2021). Developing a holistic success model for sustainable e-learning: A structural equation modeling approach. *Sustainability (Switzerland)*, *13*(16). https://doi.org/10.3390/su13169453

Albahri, A. S. (2021). Based on the multi-assessment model: Towards a new context of combining the artificial neural network and structural equation modelling: A review. In *Chaos, Solitons and Fractals* (Vol. 153). https://doi.org/10.1016/j.chaos.2021.111445

Asparouhov, T. (2021). Advances in Bayesian Model Fit Evaluation for Structural Equation Models. *Structural Equation Modeling*, *28*(1), 1–14. https://doi.org/10.1080/10705511.2020.1764360

Baloran, E. T. (2021). COURSE SATISFACTION AND STUDENT ENGAGEMENT IN ONLINE LEARNING AMID COVID-19 PANDEMIC: A STRUCTURAL EQUATION MODEL. *Turkish Online Journal of Distance Education*, *22*(4), 1–12. https://api.elsevier.com/content/abstract/scopus_id/85116790330

Banjongrewadee, M. (2020). The role of perceived stress and cognitive function on the relationship between neuroticism and depression among the elderly: A structural equation model approach. *BMC Psychiatry*, *20*(1). https://doi.org/10.1186/s12888-020-2440-9

Barillari, M. R. (2021). A structural equation model to examine the clinical features of mild-to-moderate COVID-19: A multicenter Italian study. *Journal of Medical Virology*, *93*(2), 983–994. https://doi.org/10.1002/jmv.26354

Cho, G. (2020). An empirical comparison of generalized structured component analysis and partial least squares path modeling under variance-based structural equation models. *Behaviormetrika*, *47*(1), 243–272. https://doi.org/10.1007/s41237-019-00098-0

Danks, N. P. (2020). Model selection uncertainty and multimodel inference in partial least squares structural equation modeling (PLS-SEM). *Journal of Business Research*, *113*, 13–24. https://doi.org/10.1016/j.jbusres.2020.03.019

Dijk, R. van. (2020). A meta-analysis on interparental conflict, parenting, and child adjustment in divorced families: Examining mediation using meta-analytic structural equation models. In *Clinical Psychology Review* (Vol. 79). https://doi.org/10.1016/j.cpr.2020.101861

Gracia, F. (2020). Empowering leadership, mindful organizing and safety performance in a nuclear power plant: A multilevel structural equation model. *Safety Science*, *123*. https://doi.org/10.1016/j.ssci.2019.104542

Javid, M. A. (2021). Structural equation modeling of public transport use with COVID-19 precautions: An extension of the norm activation model. *Transportation Research Interdisciplinary Perspectives*, *12*.

https://doi.org/10.1016/j.trip.2021.100474

Jeffries, D. (2020). Student Factors Influencing STEM Subject Choice in Year 12: a Structural Equation Model Using PISA/LSAY Data. *International Journal of Science and Mathematics Education*, *18*(3), 441–461. https://doi.org/10.1007/s10763-019-09972-5

Jin, M. (2021). Modeling takeover behavior in level 3 automated driving via a structural equation model: Considering the mediating role of trust. *Accident Analysis and Prevention*, *157*. https://doi.org/10.1016/j.aap.2021.106156

Jobst, L. J. (2021). A Tutorial on Assessing Statistical Power and Determining Sample Size for Structural Equation Models. *Psychological Methods*, *28*(1), 207–221. https://doi.org/10.1037/met0000423

Kang, H. (2021). Model Setting and Interpretation of Results in Research Using Structural Equation Modeling: A Checklist with Guiding Questions for Reporting. In *Asian Nursing Research* (Vol. 15, Issue 3, pp. 157–162). https://doi.org/10.1016/j.anr.2021.06.001

Katz, B. A. (2020). Reinforcement sensitivity, depression and anxiety: A meta-analysis and meta-analytic structural equation model. In *Clinical Psychology Review* (Vol. 77). https://doi.org/10.1016/j.cpr.2020.101842

Khan, A. G. (2021). Understanding the Service Quality and Customer Satisfaction of Mobile Banking in Bangladesh: Using a Structural Equation Model. *Global Business Review*, *22*(1), 85–100. https://doi.org/10.1177/0972150918795551

Kiraz, A. (2020). Analysis of the factors affecting the Industry 4.0 tendency with the structural equation model and an application. *Computers and Industrial Engineering*, *150*. https://doi.org/10.1016/j.cie.2020.106911

Li, C. H. (2021). Statistical estimation of structural equation models with a mixture of continuous and categorical observed variables. *Behavior Research Methods*, *53*(5), 2191–2213. https://doi.org/10.3758/s13428-021-01547-z

Li, F. (2020). Effects of objective and subjective environmental pollution on well-being in urban China: A structural equation model approach. *Social Science and Medicine*, *249*. https://doi.org/10.1016/j.socscimed.2020.112859

Luan, L. (2020). Exploring the role of online EFL learners' perceived social support in their learning engagement: a structural equation model. *Interactive Learning Environments*. https://doi.org/10.1080/10494820.2020.1855211

Lyu, H. (2020). The relationship among organizational identity, psychological resilience and work engagement of the first-line nurses in the prevention and control of COVID-19 based on structural equation model. *Risk Management and Healthcare Policy*, *13*, 2379–2386. https://doi.org/10.2147/RMHP.S254928

Mai, R. (2021). A tailored-fit model evaluation strategy for better decisions about structural equation models. *Technological Forecasting and Social Change*, *173*. https://doi.org/10.1016/j.techfore.2021.121142

McNeish, D. (2020). A Primer on Two-Level Dynamic Structural Equation Models for Intensive Longitudinal Data in Mplus. *Psychological Methods*, *25*(5). https://doi.org/10.1037/met0000250

Michels, M. (2021). The adoption of drones in German agriculture: a structural equation model. *Precision Agriculture*, *22*(6), 1728–1748. https://doi.org/10.1007/s11119-021-09809-8

Modaresnezhad, M. (2021). Anxiety, job satisfaction, supervisor support and turnover intentions of mid-career nurses: A structural equation model analysis. *Journal of Nursing Management*, *29*(5), 931–942. https://doi.org/10.1111/jonm.13229

Núñez-Barriopedro, E. (2021). How Does Happiness Influence the Loyalty of Karate Athletes? A Model of Structural Equations From the Constructs: Consumer Satisfaction, Engagement, and Meaningful. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.653034

Pavlov, G. (2021). Using the Standardized Root Mean Squared Residual (SRMR) to Assess Exact Fit in Structural Equation Models. *Educational and Psychological Measurement*, *81*(1), 110–130. https://doi.org/10.1177/0013164420926231

Peugh, J. (2020). "How well does your structural equation model fit your data?": Is marcoulides and yuan's equivalence test the answer? *CBE Life Sciences Education*, *19*(3), 1–8. https://doi.org/10.1187/cbe.20-01-0016

Pulido-Martos, M. (2020). Physical and psychological paths toward less severe fibromyalgia: A structural equation model. *Annals of Physical and Rehabilitation Medicine*, *63*(1), 46–52. https://doi.org/10.1016/j.rehab.2019.06.017

Rappaport, L. M. (2020). Model Fit Estimation for Multilevel Structural Equation Models. In *Structural Equation Modeling* (Vol. 27, Issue 2, pp. 318–329). https://doi.org/10.1080/10705511.2019.1620109

Romero-Rodriguez, J. M. (2020). Mobile Learning in Higher Education: Structural Equation Model for Good Teaching Practices. *IEEE Access*, 8, 91761–91769. https://doi.org/10.1109/ACCESS.2020.2994967

Saborío-Montero, A. (2020). Structural equation models to disentangle the biological relationship between microbiota and complex traits: Methane production in dairy cattle as a case of study. *Journal of Animal Breeding and Genetics*, *137*(1), 36–48. https://doi.org/10.1111/jbg.12444

Sánchez, M. d. C. G. (2021). 20Relationships among relational coordination dimensions: Impact on the quality of education online with a structural equations model. *Technological Forecasting and Social Change*, *166*. https://doi.org/10.1016/j.techfore.2021.120608

Sang, X. (2021). The Psychological Impacts of COVID-19 Home Confinement and Physical Activity: A Structural Equation Model Analysis. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.614770

Santos, P. M. dos. (2023). Construction of the average variance extracted index for construct validation in structural equation models with adaptive regressions. *Communications in Statistics: Simulation and Computation*, *52*(4), 1639–1650. https://doi.org/10.1080/03610918.2021.1888122

Shahzad, F. (2020). The moderating role of intrinsic motivation in cloud computing adoption in online education in a developing country: a structural equation model. *Asia Pacific Education Review*, *21*(1), 121–141. https://doi.org/10.1007/s12564-019-09611-2

Shi, L. (2020). The relationship between childhood trauma and Internet gaming disorder among college students: A structural equation model. *Journal of Behavioral Addictions*, *9*(1), 175–180. https://doi.org/10.1556/2006.2020.00002

Smid, S. C. (2020). Bayesian Versus Frequentist Estimation for Structural Equation Models in Small Sample Contexts: A Systematic Review. In *Structural Equation Modeling* (Vol. 27, Issue 1, pp. 131–161). https://doi.org/10.1080/10705511.2019.1577140

Soltanpour, A. (2020). Customer satisfaction in urban rail: a study on transferability of structural equation models. *Public Transport*, *12*(1), 123–146. https://doi.org/10.1007/s12469-019-00223-y

Song, Y. (2022). Anxiety and its relationship with sleep disturbance and problematic smartphone use among Chinese medical students during COVID-19 home confinement — A structural equation model analysis. *Journal of Affective Disorders*, *296*, 315–321. https://doi.org/10.1016/j.jad.2021.09.095

Tekce, I. (2020). Structural Equation Model of Occupant Satisfaction for Evaluating the Performance of Office Buildings. *Arabian Journal for Science and Engineering*, *45*(10), 8759–8784. https://doi.org/10.1007/s13369-020-04804-z

Torresin, S. (2022). Indoor soundscapes at home during the COVID-19 lockdown in London – Part II: A structural equation model for comfort, content, and well-being. *Applied Acoustics*, *185*. https://doi.org/10.1016/j.apacoust.2021.108379

Useche, S. A. (2021). Not gendered… but different from each other? A structural equation model for explaining risky road behaviors of female and male pedestrians. *Accident Analysis and Prevention*, *150*. https://doi.org/10.1016/j.aap.2020.105942

Wang, T. (2021). The impact of gamification-induced users' feelings on the continued use of mhealth apps: A structural equation model with the self-determination theory approach. *Journal of Medical Internet Research*, *23*(8). https://doi.org/10.2196/24546

Xi, Y. (2020). Post-traumatic stress disorder and the role of resilience, social support, anxiety and depression after the Jiuzhaigou earthquake: A structural equation model. *Asian Journal of Psychiatry*, *49*. https://doi.org/10.1016/j.ajp.2020.101958

Yang, D. (2021). Fusing crash data and surrogate safety measures for safety assessment: Development of a structural equation model with conditional autoregressive spatial effect and random parameters. *Accident Analysis and Prevention*, *152*. https://doi.org/10.1016/j.aap.2021.105971

Yang, X. (2022). Characteristics of greenhouse gas emissions from farmland soils based on a structural equation model: Regulation mechanism of biochar. *Environmental Research*, *206*. https://doi.org/10.1016/j.envres.2021.112303