# Professor, Student, and Course Attributes that Contribute to Successful Teaching Evaluations

Michael J. Seiler, Vicky L. Seiler, and Dalen Chiang

This study examines eight professor, student, and course attributes that affect four specific areas of teaching evaluations. All eight attributes significantly affect at least one of the four groups of student evaluation of teaching (SET) questions. The extant literature has previously ignored the fact that more than one factor exists. This has resulted in contradictory or inconclusive findings. Our study uses a more sophisticated methodology that allows for the delineation of all these intricate relationships. As a result, more clear and robust results emerge. [JEL: 120, 122, A00]

■ Universities and colleges recognize more than ever the need to achieve high levels of teaching performance in the classroom. Accordingly, this desire is being reflected by promotion and tenure (P&T) committees who have adjusted their criteria across all business majors (Accounting Education Change Commission, 1990; Bures and Tong, 1993; Burnett, Amason, and Cunningham, 1989; and Schultz, Meade, and Khurana, 1989). Yunker and Sterner (1988) found that student evaluations of teaching (SET) is the primary instrument used to evaluate teaching effectiveness in almost every college and university in the country. Moreover, Tompkins, Hermanson, and Hermanson (1996) find that the percentage of time spent teaching can be as high as 50%-70%. Because so much time and importance is associated with teaching, P&T committees should make sure they are able to evaluate a professor's teaching effectiveness as accurately as possible.

The purpose of this study is to examine a SET survey in order to assess how accurately universities are measuring professor performance in the classroom. More specifically, we examine eight professor, student, and course attributes that affect SET evaluations in

Michael J. Seiler is an Assistant Professor of Finance and Vicky L. Seiler is an Assistant Professor of Marketing at Hawaii Pacific University, Honolulu, HI 96813. Dalen Chiang is a Professor at Cleveland State University.

four distinct areas. This has never been done before.

The data used in the current study is from a single university. However, it is representative of the SET surveys used around the country. For example, studies using SET surveys that ask the same questions as the survey under examination include Tenant and Lawrence (1975)-(time of day), Howell and Johnson (1982), and Stout, Bonfield, and Battista (1987)-(class meeting time), Brandenburg, Slinde, and Batista (1977), Marsh (1987), and Wright, Whittington, and Whittenburg (1984)-(required course versus elective), Rayder (1968)-(major), Deberg and Wilson (1990), McKeachie (1979), and Wright, et al. (1984) (professor characteristics), Mulford and Schneider (1988)-(undergraduate versus graduate), Bell, Frecka, and Solomon (1993), and Kinney (1989)-(research versus non-research oriented), and -(professor specific characteristics). Hence, the results in this study are generalizable to the extent that SET surveys across institutions measure the same general variables.

## I. Data

All teaching evaluations are from the Department of Finance, Spring 1996, at a mid-sized American Assembly of Collegiate Schools in Business (AACSB) accredited university in the mid-west. The university's College of Business offers both undergraduate and graduate degrees in business. Hence, the survey consists of both classifications of students. A total of 17 classes are studied with a student response rate of 62.3% (467 enrolled, 291 completed questionnaires). There is no difference in response rates between graduates and undergraduates. Of the 17 classes, eight are undergraduate, and nine are Masters in Business Administration (MBA). Of the classes, 11 are taught at night, while six are offered during the day. Elective classes total ten, and required classes equal seven. There are ten teachers involved in this study. Half of them are full-time, six are tenured, and seven are research-oriented.1 It is not the case that all tenured professors are full-time or research-oriented.

Classes are taught by various combinations of tenured professors, part-timers, and doctoral students.<sup>2</sup> Exhibit 1 provides the actual teaching evaluation survey used by the university. The survey is a standard 34 item questionnaire and employs a seven-point semantic difference scale with one representing the lowest score possible and seven being the highest.

The first six questions in the survey are asked to gain information concerning the responding student's background. Questions 1 through 3 are to be filled out by both undergraduates and MBA students, while only graduate students are to complete questions 3 through 6. Questions 7 through 34 are to be answered by all students and will be the focus of our analysis.

## II. Hypothesis

Based on the extant literature, there are eight hypotheses that will be tested.

#### A. Professor Attributes

H<sub>10</sub>: There is not a significant difference between the

The university under study is a research institution that operates on a quarter system. We define full-time as tenure-track or already tenured faculty members. A full-time course load is two classes per quarter for those who are deemed research-oriented and three courses per quarter for those who are not. A sliding scale is in place for faculty who fall somewhere between the ends of the spectrum. Like most institutions, research orientation is not a completely objective classification. It is based on a combination of both publication frequency and quality of the outlet journal. However, these classifications are clearly known to all professors because of the directly observable course load requirement of each faculty member. In this study, a very clear separation exists between research-oriented and non-research-oriented professors.

<sup>2</sup>Although doctoral students do teach exclusively on a parttime basis, a distinction is made between them and adjunct professors from the outside because it is reasonable that differences may exist between the two groups. SET scores of full-time and part-time faculty members.

From a department's point of view, it is much less expensive to hire part-time professors from the industry or use students from the doctoral program. However, full-time professors are expected to perform better in the classroom because this is what they do for a living. There is also a concern for AACSB accreditation. If too many part-timers or non-PhD teachers are used, the university will not meet the minimum accreditation standards. Therefore, the purpose of testing this hypothesis is to determine the extent, if any, to which the employment of less expensive part-time instructors is less effective than using only full-time professors.

H2<sub>0</sub>: There is not a significant difference between the SET scores of tenured and non-tenured faculty members.

The second classification for teachers is whether they are tenured or not. The crux of this examination is whether tenured faculty will relax in their teaching effectiveness (behavior) due to job security or whether their years of extensive teaching experience has readied them to perform better in the classroom.

H3<sub>0</sub>: There is not a significant difference between the SET scores of research-oriented and non-researchoriented faculty members.

Bell, Frecka, and Solomon (1993) argue that in order to be effective in the classroom, one must possess knowledge of what is going on outside the classroom. In theory, research is designed to provide professors with this type of outside knowledge. They further state that many of the skills necessary to be successful in research are required in the classroom. Hence, a third professor attribute to consider is whether or not the teacher is actively involved in research. This hypothesis has been echoed by numerous sources (Dyckman, 1989; Kaplan, 1989; and Kinney, 1989). The general conclusion is that there does exist a significant positive relationship between research and teaching effectiveness.

#### **B. Student Attributes**

H4<sub>0</sub>: There is not a significant difference between the SET scores reported in MBA and undergraduate classes.

Hypothesizing whether MBA students rate higher or lower than undergraduates is not straightforward. Mulford and Schneider (1988) hypothesized that MBA students are more refined and constructive in their evaluations and that their standards are so much higher than those of undergraduates that professors will find it more difficult to appease them. McKeachie (1979), Mulford and Schneider (1988), and Sperry and Olds (1986) have all found a non-significant effect.

Exhibit 1. Student Evaluation Surve	У									
Part I. Background Information					(	Grac	luat	e St	udents ONLY)	
Q1 Year in School									GPA	
Q2 Undergraduate Major									Undergraduate Degree Fron	m?
Q3 Undergraduate GPA		Q6 If Graduate, Number of Courses Taken								
Part II. Descriptive Items on Professor	rs									
Twelve sets of items are listed below.	Mar	k tl	he bo	о хо	n th	e an	swe	r sh	eet that corresponds to the l	etter on the
scale which best describes your feelings										
letter for each set.										•
Q7 Fair	Α	1	В	C	D	Е	F	G	Unfair	
Q8 Muddled Thinking	A			C	D	E	F	G	Clear Thinki	nσ
Q9 Irresponsible	A			C	D	E	F	G	Responsible	
Q10 Thoroughly Knowledgeable	A				D	E	F	G	Unknowledg	
Q11 Helpful	A	_		C	D	E	F	G	Not Helpful	caoic
Q12 Unoriginal	A			C	D	E	F	G	Original	
Q13 Enthusiastic				C	D	E	F	G	Unenthusias	tio
	Α	. 1	Б	C	ט	E	Г	G		
Q14 Encourages		1	D.	C	Ъ	17	17	C	Discourages	
Critical Thinking	A			C	D	Е	F	G	Critical Thin	
Q15 Poor Listener	A				D	Е	F	G	Good Listen	er
Q16 Humorless	A				D	Е	F	G	Humorous	m 1:
Q17 Likes Teaching	A			C	D	Е	F	G	Doesn't Like	
Q18 Lacks Confidence	A	. 1	В	C	D	E	F	G	Highly Conf	ident
Q19 In comparison to faculty member this professor?	rs ou	itsio	de th	e C	olle	ge of	f Bu	sin	ess Administration, how wou	ıld you rate
A B C			Γ	)			Е		F G	
One of Very Belo	W		Aveı	rage	3	Αŀ	ove	е	Very One of	
The Worst Poor Avera	ge			Ū		Av	erag	ge	Good the Best	
Q20 In comparison to faculty membe this professor?	rs w	ithi	in the	e Co	olleg		_		ess Administration, how wou	ıld you rate
A B C			]	D			E		F G	
One of Very Below	V		Ave	rag	e		ove	•	Very One of	
the Worst Poor Averag						Ave			Good the Best	
		Co	11#00							
Part III. Descriptive Items Concerning Fourteen sets of items are listed below.					on th	ne ar	iswe	er sl	neet that corresponds to the l	etter on the
scale which best describes your feelings	aboı	ıt tl	he co	ours	e fo	r eac	ch of	f the	e 14 sets. Please indicate onl	y one letter
for each set.										
Q21 Standards Undemanding	A	В	C	Γ	) F	ΞΕ	7 (	G	Standards Extremely Dema	nding
Q22 Course Materials Stimulating	A	В	C	Γ				G	Course Materials Boring	Ü
Q23 Course Materials Very Relevant		В	C	Γ				G	Course Materials Irrelevant	t
Q24 Written Assignments Valuable		В	C	Γ				G	Written Assignments of no	
Q25 Magnitude of Work Very Heavy		В	C	Γ				G	Magnitude of Work Extrem	
		В	Č	Γ				Э	Course is of Little Value	uning Englis
Q27 Course Content too	A	_		_					Course Content too	
much for one term	A	В	C	Γ	) E	E F	7 (	G	little for one term	
Q28 Syllabus Highly Useful		В	C	Ι				G	Syllabus of no use	
Q29 Course Very Challenging		В	C	Ι				G	Course offered no Challeng	TΑ
		В	C					G	Teaching Methods Highly In	
Q30 Teaching Methods Appropriate Q31 Course Objectives Clear		В	C	Ι				J G	Course Objectives Unclear	
Q32 Class Well Organized	A A	В	C	Γ				G G	Class Poorly Organized	
Q33 Course Content Exceeded	A	D	C	L	, [	1 ن	,	U	Course Content Did	
	٨	В	C	Г	) E	E F		~		
Expectations	A							ე .ე	Not Exceed Expectations	
Q34 All in all, how much do you feel yo	ou le	arr	iea f	ron	ı (nı	s coi	urse	: (		

A B C D E F G Nothing at All

A Great Deal

H5<sub>0</sub>: There is not a significant difference between the SET scores reported by finance and non-finance majors.

The second student attribute is the distinction between finance majors and other business majors. Clearly the hypothesis here is that finance majors would evaluate professors in finance classes higher because the students are naturally more interested in the course (as indicated by the fact that they chose finance as their major). This notion dates back as early as Rayder (1968).

H6<sub>0</sub>: There is not a significant difference between the SET scores reported by students with varying GPAs.

It is human nature to take a liking towards those things that we do well. Therefore, there may be a positive relationship between the student's GPA (the thing they do well) and the level of their evaluations. Mulford and Schneider (1988) explain that students are willing to look past many negative attributes the instructor might possess as long as the outcome of the class (grade) is good.

#### C. Course Attributes

H7<sub>0</sub>: There is not a significant difference between the SET scores reported in day and night classes.

Time of day has been recognized as a significant explanatory variable in numerous studies (Nichols and Soper, 1972; and Tennant and Lawrence, 1975). The literature in this area is not in complete congruency, however, as Mulford and Schneider (1988) and Sperry and Olds (1986) detect no significance. Their hypotheses are summarized as follows. Night classes tend to be less desirable because it is more difficult to pay attention at night (in many cases after working all day).

H8<sub>0</sub>: There is not a significant difference between the SET scores reported in required and elective classes.

Most professors would agree that teaching upper level classes in their field is more enjoyable than teaching the principles and other introductory classes. It can be argued that upper-level classes are more rewarding because they are geared towards more specific subjects or sub-fields (which hopefully match the interests of both professors and students alike). Principles classes, on the other hand, are less enjoyable because all students independent of their major are required to take them. When students are required to take a class that they very much do not want to be in, they tend to be much less enthusiastic and much less willing/able to motivate themselves. This experience is usually less satisfying for both professors and students. In sum, our premise is that the more a student desires to be in the class, the higher will be their evaluation of the class. For this reason, we test for a possible distinction in SET scores between a required class and an elective class. The empirical literature in this area is mixed (Wright, Whittington, and Whittenburg, 1984; and McKeachie, 1979). Gage (1961), for example, concluded that elective classes yielded higher ratings whereas Mulford and Schneider (1988) found no effect.

# III. Methodology

Before the hypotheses can be tested, several of the SET questions (21, 25, 27, and 29) must be re-scaled. Parasuraman, Zeithaml, and Berry (1988) in a discussion on service quality define all services as vector attributes. This simply means that the more of a service we get the more satisfied we are. For example, if customer service representatives respond more quickly to your complaints and solve your problem in less time, the more satisfied you would be. For these types of services, a scale from one to seven with seven being the best is sufficient to rate service quality.

Teas (1993) elucidates this notion by positing that more of an attribute is not necessarily better. For example, if you go to a restaurant and get friendly service, the more friendly the better, but only to a certain point. After you reach saturation, you may perceive the added service as intrusive and bothersome. Teas argues that for these attributes a seven-point scale from one to seven is misleading and will not capture the ideal level of desired service. This appears to be the case in the university's survey question number 27. The question asks the student if the course content is too much or too little for one quarter. Ideally, the answer would be that it is just right. The university, however, assigns professors a higher rating if the student responds that the course content is too much for one quarter. In this case, the ideal point should shift from the current level of seven down to the more appropriate level of four. The same argument/scale should be applied to questions 21, 25, and 29. To correct for this scaling error, we adjust the SET scores of questions 21, 25, 27, and 29 by converting SET scores of 1 and 7 to 1, 2 and 6 to 3, 3 and 5 to 5, and 4 to 7.

Previous studies have examined various professor, student, and course attributes to determine how they affect SET scores in aggregate. This is problematic because SET questions do not all ask the same types of questions. For example, many of the questions are directed to assess the quality of the professor (professor characteristics), while others ask about the quality of the course (course characteristics). Because professor, student, and course attributes may affect groupings of SET questions differently, researchers who examine SET questions in aggregate are not able

to reach a definite conclusion concerning which attributes lead to higher SET scores.

The survey under examination asks 28 SET questions. To determine the number of factors or distinct groups to which these 28 questions belong, we perform a factor analysis. The results shown in Part A of Exhibit 2 indicate that there are four distinct factors.<sup>3</sup> Moreover, these factors explain 69.8% of the overall variation in the model.

In Part B of Exhibit 2, factor loadings greater than 0.5 are shown. Several interesting results are observed. There are four significantly distinct factors or groups of SET questions. The first consists of questions 7-11, 13-15, 17-20, 28, and 30-34. Since all these questions directly refer to specific professor characteristics, we label this factor, "professor characteristics." The second group of SET questions contains questions 21, 25, 27, and 29. Each of these refers to the amount of work required in the course. For this reason, this factor is titled, "course workload." The third factor consists of questions 12 and 16 and is labeled, "superfluous professor characteristics" because although these are definite characteristics of the professor, being humorous and original are not necessary to be a good teacher.4 The final factor is "course characteristics" consisting of questions 22-24, and 26.

Now that we have empirically shown that SET questions ask specific professor and course characteristics, we will examine the relationship between the eight professor, student, and course attributes (full-time versus part-time, tenured versus non-tenured, researched-oriented versus non-research-oriented, MBA versus undergraduate, finance major versus non-finance major, GPA, day versus night classes, and required class versus elective class) and the four SET factors or groups. In previous studies, these eight attributes have only been tested in reference to aggregate SET scores.

Because of the large number of variables present and since many of the relationships are non-recursive (two-way), an advanced statistical procedure known as LISREL (Linear Structural RELations) must be used to identify the various relationships among the

<sup>3</sup>Kreuze and Newell (1987) and Porcano (1984) also performed a factor analysis on SET variables and yielded many of the same factors that we find in the current study. This offers further evidence that the survey under current investigation is representative of that which is used in other institutions. <sup>4</sup>Originality could be viewed as a necessary characteristic to be a successful. However, consider the professors who teach a principles class. The characteristic of humor being superfluous is a bit easier for us all to agree upon. Even if you do not accept these to be significantly different from the other professor characteristics in theory, the empirical analysis has shown them to be statistically significantly different. For these reasons, they are analyzed as separate professor characteristic groupings.

variables. LISREL is a statistical method that combines features of multiple regression, factor analysis, and path analysis to allow the examination of both observed and latent variables.

### IV. Results

Figure 1 shows a diagram of the relationships tested. The arrows represent directional paths that are significant at the 0.05 level. The results indicate that all professor, student, and course attributes significantly affect at least one of the four factors. Interestingly, when examining each attribute individually, the results reveal that many of the eight attributes affect the four factors differently; some are positively related, while others are negatively related. This is an extremely important finding because it explains how previous studies could reach different conclusions when testing SET scores in aggregate instead of by specific groupings or factors. That is, by combining the four factors together, the significantly positive and significantly negative relationships could cancel each other out causing the researcher to erroneously conclude that no significant relationship existed.

It would be cumbersome to discuss all 23 individually significant paths. For the sake of brevity, we highlight our findings and compare and contrast them to the findings of previous studies. First, for the three professor attributes, the results show that part-time teachers receive better evaluations than full-time teachers. The policy implication is that, barring AACSB minimum requirements, the university should not hesitate to seek working professionals to teach classes part-time. Results surrounding tenured faculty members is mixed. Finally, research-oriented professors score significantly higher in both professor characteristics categories, but significantly lower in the area of workload. That is, they are perceived by students to give too much or too little work in the course. Too much of a workload could be explained by the professors' opinion of how much "too much" is, based on the notion that researchers are quite driven. Too little work required in the course could be explained by the fact that researchers are very busy and the more work they give, the more they have to grade. Overall, the finding of higher SET scores is consistent with the extant literature.

The three student attributes are also different across the four factors. MBA students give more favorable scores on course characteristics, but are harsher on professor characteristics. This finding is consistent with our hypothesized relationship. Finance majors are almost completely indistinguishable from non-finance majors from a statistical point of view. This finding is in contrast

Exhibit 2. Factor Analysis For Survey Questions 7 Through 34

Factor	Eigenvalue	Percentage of Explained Variation	Cumulative	Percentage of Expla	ained Variation
1	14.78	52.8%		52.8%	
2	2.28	8.1%		60.9%	
3	1.38	4.9%		65.8%	
4	1.13	4.0%		69.8%	
		Panel B. Average Answer of Eac	ch Question By	Factor	
Question		Factor 1	Factor 2	Factor 3	Factor 4
Q7 Fair		0.63314			
Q8 Clear T	hinking	0.81685			
Q9 Respon	sible	0.92556			
Q10 Know	ledgeable	0.72377			
Q11 Helpfu	1	0.82751			
Q13 Enthus	iastic	0.76562			
Q14 Encou	rages Thinking	0.57863			
Q15 Good	Listener	0.74407			
Q17 Likes	Teaching	0.89607			
Q18 Confid	ence	0.76926			
Q19 Univer	sity's Best	0.91434			
Q20 Colleg	e's Best	0.91312			
Q28 Useful	Syllabus	0.51559			
Q30 Appro	priate Methods	0.73091			
Q31 Course	e Objective	0.62507			
Q32 Class	Objective	0.75685			
Q33 Course	e Content	0.55919			
Q34 Amou	nt Learned	0.61808			
Q21 Standa	rds Demanding		0.75963		
Q25 Heavy	Workload		0.78140		
Q27 Conte	nt Too Much		0.61752		
Q29 Course	e Very Challenging		0.77182		
Q12 Origin	al			0.63298	
Q16 Humo	urous			0.74670	
Q22 Mater	als Stimulating				0.83163
Q23 Mater	als Relevant				0.71374
Q24 Assign	ments Valuable				0.68297

to what was expected. Finally, GPAs are significantly positively related to all but one group of SET scores. This is very much in line with previous findings.

Q26 Course of High Value

The first course attribute, time of day the class was offered, also results in different SET scores across factors. Day classes are associated with higher course characteristic scores, but lower professor characteristic scores. Concerning required courses, students who must take the class do rate the course lower than in elective classes. This notion is consistent with previous works.

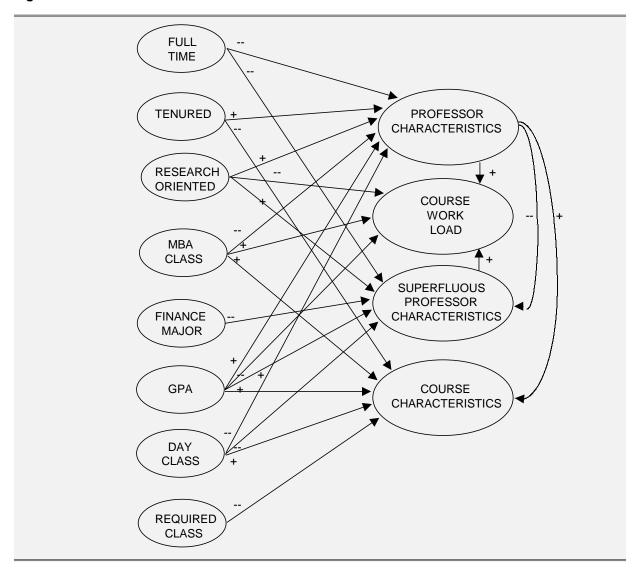
In addition to measuring the effect of the eight attributes on the four factors, LISREL also makes it

possible to examine the relationships, if any, amongst the four factors. This is an area that has been completely untouched by previous researchers. As expected, professor characteristics affect the scores that professors get in the areas of workload and course quality (factors 2 and 4, respectively). For example, "good" professors also tend to be "good" at keeping the workload at an appropriate level (factor 2) and making the course beneficial to the students (factor 4).

0.74948

In addition to demonstrating the significant relationships amongst the variables, LISREL also allows the researcher to assess the model's overall fit. A summary of these measures are shown in Exhibit 3.5

Figure 1



In short, the robustness of this model lends further support for the results discussed above.

#### V. Conclusions

This study examines 291 teaching evaluations to determine which professor, student, and course attributes contribute to high teaching evaluations. Several contributions are made to the literature. First, we show that some SET questions may have to be rescaled in order to avoid biasing results. Second, we use factor analysis to demonstrate that four significantly different groups of SET questions exist. Third, we use an advanced statistical procedure, LISREL, to identify that these distinct groups of questions, or factors, are affected differently by

professor, student, and course attributes. Previous studies have ignored this by aggregating SET scores, which have resulted in mixed and contradictory findings over time.

Overall results from testing the eight hypotheses reveal the following. Research oriented professors, part-time professors, MBA students, students with high GPAs, and elective classes yield higher SET scores. The results are mixed in the areas of time of day the class was offered, student major, and whether or not the professor is tenured.

Although the results are quite robust, we are quick to point out that these results were gathered from just one university, thus we should be careful to not necessarily generalize these results to universities across the country. However, we do show that the current survey instrument is representative of the typical SET instrument used around the country. Moreover, we show that

<sup>&</sup>lt;sup>5</sup>For the sake of brevity, we omit the lengthy discussion of and rules for assessing overall model fit.

Exhibit 3. Significant t-Statistics and Goodness-of-Fit Measures for the Final LISREL Model

	Professor Character	Course Workload	Superfluous Professor Character	Course Character
Full-Time	-4.76		-8.08	
Tenured	2.84			-2.28
Research-Oriented	11.75	-5.36	7.72	
MBA Class	-3.55	2.20		3.22
Finance Major			-2.48	
GPA	6.48	-2.68	5.72	4.51
Day Class	-4.76		-6.32	2.81
Required Course				-4.15

	Professor Character	Course Workload	Superfluous Professor Character	Course Character
Professor Character				
Course Workload	3.70		2.57	
Superfluous Professor Character	-8.66			
Course Character	13.56			

Overall Model of Goodness-of-Fit Measures	Value	
Chi-Square Value	8.87	
Degrees of Freedon	15	
p-Value	0.884	
Chi-Square Value/DF	0.591	
Goodness-of-Fit Index	0.995	
Adjusted Goodness-of-Fit	0.976	
Root Mean Square Residual	0.031	

previously used methods of examining the above discussed issues have been inadequate. Future research

efforts should be directed at testing the generalizability of these findings using the framework we have provided. ■

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