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CAT in the classroom: A multilevel analysis of students' experiences with instructor nonaccommodation

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ABSTRACT

This study incorporates communication accommodation theory to investigate how student perceptions of instructor nonaccommodation influence affective and cognitive classroom outcomes. A series of two-level hierarchical linear models (students nested within instructors) revealed significant, negative associations between specific modes of instructor nonaccommodation (i.e., nonaccommodation related to nonverbal responsiveness, content knowledge, and student support) and students' reported outcomes. Specifically, nonaccommodation related to nonverbal responsiveness and student support resulted in less communication satisfaction and instructor–student rapport when controlling for student sex and expected grade in a course. Contrarily, only nonaccommodation related to content knowledge predicted processing fluency. The research provides instructional communication researchers with a unique theoretical framework for conceptualizing and assessing student perceptions while also raising important questions regarding how students prioritize effective teaching behaviors in context. Practical implications are provided for how instructors better assess and enact behavior relative to individual student needs.

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Across disciplines, scholars identify communicative adjustment, or adapting verbal or nonverbal behavior in context (Gasiorek, 2016a), as a fundamental component of human interaction. Yet, despite its importance, limited instructional communication research has incorporated this framework as an explanatory vehicle for understanding classroom processes (Soliz & Giles, 2014). Few would disagree that the premise of adjustment extends to encounters between instructors and students, who adapt behavior in situations like providing feedback or conversing about bad grades (e.g., Wright, 2012). An extension of this reasoning suggests instructors adjust communication behavior to create shared meaning with students. Likewise, students who interpret an instructor's adjustment as appropriate and consistent with their needs are likely to have more positive classroom experiences. Collectively, an adjustment framework may enhance our understanding of how communication is enacted and received in a classroom or training setting.

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One of the most comprehensive frameworks for adjustment is communication accommodation theory (CAT; Giles, 1973, 2016). Researchers use CAT to understand why messages are unsuccessful; the theory posits that listeners perceive adjustments as inappropriate when they fail to meet or exceed needs—an outcome characterized as *nonaccommodation* (Coupland et al., 1988). As a result, CAT presents a robust framework for understanding how and when students perceive instructor behavior as ineffective, as well as what effect this may have on classroom experiences. The current study provides an initial exploration of CAT as a method for explaining how students' perceptions of instructor nonaccommodation influence their reports of communication satisfaction, instructor–student rapport, and processing fluency.

The importance of student perceptions

Much of what scholars know about effective instruction stems from students' interpretations of behavior (Nussbaum, 1992). However, instructional scholars should embrace ideas about how perceptions change as a function of the students making them; student perceptions are connected to their personal or social identities. For example, Hosek and Soliz (2016) suggested that student perceptions of instructor behavior are influenced by their respective positions within a larger social hierarchy. This hierarchy draws upon group-based scripts, stereotypes, and expectations to directly influence the enactment and reception of communicative messages. Thus, although it is vital that scholars understand what instructors' intentions are when communicating with students, the reality is that student identities and the instructional context may result in an intended instructor message not being the one received by students.

Further, this call to rethink student perceptions can offer a fresh perspective on knowledge claims surrounding what constitutes effective classroom communication. One might anecdotally consider instructional scenarios where behaviors identified as problematic might enhance interactions with students (e.g., pushing back a deadline). Interest in strategic ambiguity suggests that instructors who provide a lack of information necessary for understanding can achieve positive learning outcomes (Klyukovski & Medlock-Klyukovski, 2016). Students clearly interpret similar behaviors in a variety of ways, and researchers should continue to develop theoretical explanations that can account for these differences. Accordingly, Soliz and Giles (2014) articulated that "in the instructional context, CAT could be used to examine the motivation and relational or instructional outcomes (affect for learning, cognitive learning) associated with teacher–student (non)accommodation in and outside of the classroom" (p. 132).

Communication accommodation theory

CAT explains how and when individuals adjust communication behavior as a means of facilitating understanding (i.e., cognitive function) and managing social distance (i.e., affective function), along with what consequences follow from those adjustments (Dragojevic et al., 2016). Relevant to the current study, CAT also presents a theoretical rationale that aligns with the need to better conceptualize students' perceptions. Specifically,

researchers use CAT to explore communicative adjustment based on listeners' subjective evaluations through which they might interpret similar behaviors in a variety of ways (Frey, 2019; Giles, 2016; Giles & Gasiorek, 2013). In this regard, "communication is considered accommodative when it is perceived to be appropriate and facilitating interaction in a desirable way" (Gasiorek & Dragojevic, 2017, p. 278). Concurrently, when a listener feels a speaker's adjustment does not meet their needs, it is considered *nonaccommodative* (Coupland et al., 1988; Gasiorek, 2016b).

Further, nonaccommodation implies that individuals hold a desired (i.e., optimal) level of adjustment for interactions within specific contexts (Gasiorek & Dragojevic, 2017). How nonaccommodation is perceived depends on individual evaluations of behavior relative to this expectation; what might be considered nonaccommodative in one situation may be situationally appropriate in another. Regardless of the qualities of the observed behavior, messages can become ineffective when they do not meet or when they surpass a listener's expected level of appropriateness in an interaction. Instructional communication scholarship has previously insinuated this claim (e.g., Comstock et al., 1995), and CAT presents a novel explanation for their findings.

As an illustration, Richmond et al. (1987) speculated that high levels of instructor immediacy (e.g., eye contact, touch, or other attempts to decrease psychological distance) may not develop more student learning than moderate levels of immediacy. Essentially, the authors surmised that immediacy may reach a point where it no longer increases perceptions of learning. CAT theoretically suggests that students' perceptions of the frequency of instructor behaviors, like immediacy, may reach a point whereby they surpass expectations of appropriateness (i.e., their optimal level of adjustment; Jones et al., 1994), and thus may be seen as nonaccommodative. Ultimately, these findings contribute to the scholarly debate about the linear nature of relationships between instructor behavior and student outcomes like learning (Christensen & Menzel, 1998) or instructor credibility (Simonds et al., 2006), and CAT offers a unique perspective for exploring these relationships further. The current study builds on this perspective by examining how student perceptions of nonaccommodation influence their affective and cognitive experiences.

Outcomes of nonaccommodation

CAT states that outcomes are based on the perceived appropriateness of adjustment in an interaction (Dragojevic et al., 2016). In understanding these judgments, research has identified a host of correlates stemming from individual perceptions of behavior, including evaluations of the speaker (e.g., credibility; Aune & Kikuchi, 1993), liking and closeness (Harwood, 2000), and quality of communication (Watson & Gallois, 1999). Taken together, the results of several studies support the general tenets of CAT—namely that perceived accommodative behavior facilitates positive outcomes, while perceived nonaccommodative behavior has the opposite effect (Gasiorek & Giles, 2012; Soliz & Giles, 2014). We expect these claims to generalize to the classroom context and as such, we seek to evaluate these claims more directly by first investigating the influence of perceptions of nonaccommodation on students' affective outcomes. Specifically, students who perceive an instructor as nonaccommodative should feel less satisfied and report lower rapport with an instructor.

Communication satisfaction and rapport

Hecht (1978) conceptualized communication satisfaction as an internal, affective state occurring in response to feedback experienced in the accomplishment of a communicative goal. Students have affective needs that must be met to facilitate positive classroom experiences, and instructors who communicate in appropriate ways reinforce this feeling. Indeed, some scholars argue that students' satisfaction from communication with instructors should be an essential learning outcome of critical importance to instruction (Goodboy et al., 2009; Goodboy, 2011). However, scholars have also conceptualized students' affective needs to include expectations for a relationship with an instructor (Frey & Tatum, 2016). This idea is encompassed by Frisby and Martin (2010) through their definition of instructor–student rapport: "an overall feeling between two people encompassing a mutual, trusting, and pro-social bond" (p. 147). Rapport reflects students' perceptions of the quality of the connection they have with an instructor and is positively related to important classroom outcomes such as student participation (Frisby & Myers, 2008) and teacher efficacy (Frisby et al., 2016).

Since perceived nonaccommodation has consistently resulted in negative relational consequences, we expect this finding to persist in the classroom setting (Gasiorek, 2015). Recall that listeners experience nonaccommodation when perceived adjustment does not meet their needs. Instructors who are perceived to communicate inappropriately (i.e., nonaccommodate) are less likely to meet students' affective expectations and goals. That is, as the perception of instructor behavior moves further from a student's optimal level of appropriateness, the student should feel less satisfied with their instructor. Similarly, perceptions of behavior as inappropriate should also lead to less perceived rapport with an instructor. Even prosocial behaviors that facilitate high-quality instructor–student relationships (e.g., encouraging questions from students, spending additional time explaining concepts; Frisby & Buckner, 2018) may become inappropriate when they do not meet a student's need for that behavior. For example, Gasiorek and Giles (2012) manipulated the same instructor behavior—a teaching assistant providing explanations of course content—to be perceived as nonaccommodative when the explanation (a) did not contain enough information and (b) contained too much information. It seems likely that, at a point, students might begin to ascribe motives to an instructor's behavior such that it becomes characterized by disinterest, disrespect, unfairness, or other negative outcomes, all of which should mitigate quality relational development (Gasiorek & Dragojevic, 2017; Jones et al., 1994; Wilson et al., 2010). Considering this argument, we propose the following hypotheses:

H1: Students who perceive more instructor nonaccommodation will report decreased communication satisfaction.

H2: Students who perceive more instructor nonaccommodation will report decreased instructor–student rapport.

Information processing

Apart from affective outcomes, CAT also posits that adjustment fulfills a cognitive function for listeners. That is, perceptions of appropriate adjustment facilitate

comprehension. For example, Hewett et al. (2009) argued that doctors' use of obscure and specialized symbols, diagrams, and jargon within patient medical records created various misunderstandings for others relying on the records for care. It seems clear that instructors also use a variety of specialized language in their everyday interactions with students, and studies have shown that students' perceptions of an instructor's effort to adjust this language toward their needs and characteristics can enhance teaching effectiveness and help with information retention (Mazer & Hunt, 2008). The perception that a speaker has organized their behavior by taking one's needs into account should lead to a simpler processing experience (Gallois et al., 2005). Said differently, perceptions of nonaccommodation should decrease processing fluency, or the ease with which individuals process information and encode it into memory (Alter & Oppenheimer, 2009; Hertzog et al., 2003).

Alter and Oppenheimer (2009) suggested that any cognitive task can be characterized by the amount of effort that one has to put forth to complete it. Some tasks may require less effort (highly fluent), while other tasks may require more effort (highly disfluent). We propose extending this reasoning to classrooms, where students must complete a variety of tasks in relation to the instruction they receive, including comprehending, retaining, synthesizing, or applying knowledge. The ease with which individuals can achieve these tasks is likely to be influenced by the manner in which the material they must know to do so is presented to them.

Essentially, nonaccommodation presents a process whereby students' mental processing capability is split; their focus shifts between processing the inappropriately perceived behavior and the information they are supposed to learn. When this level of distraction and additional effort is present, the ease, or fluency, of processing the information will be lessened. Reber and Greifeneder (2017) effectively summarize this relationship: "disfluency hampers learning when it comes from extraneous sources that distract learners from encoding and integrating information" (p. 91). Students in past research have noted that perceived nonaccommodation by an instructor has resulted in less comprehension, specifically citing the inappropriate use of complex vocabulary and a fast-speaking rate (Gasiorek & Giles, 2012). Moreover, as Bolkan (2016) suggested, those instructors who present information inappropriately (e.g., unclearly) can "make it difficult for students to spend time thinking about the meaning of information being presented because they have fewer cognitive resources to devote to essential learning task" (p. 160). Perceptions of instructor nonaccommodation likely overload students with unnecessary information, which means they should have more difficulty processing information (Bolkan & Goodboy, 2020).

Collectively, perceived nonaccommodation should directly affect students' experiences processing information. This mitigates their ability to internalize information into their working memories and invokes more cognitive resources. In turn, it seems likely that students will report less processing fluency following nonaccommodation, as they will likely spend more cognitive effort processing the inappropriate behavior. This leads to the following hypothesis:

H3: Students who perceive more instructor nonaccommodation will report less processing fluency.

Methods

Participants

Participants were recruited as part of an ongoing assessment of the basic communication course at a large Southeastern university. Participants consisted of 549[1] undergraduate students enrolled across 38 sections of the course. A total of 17 instructors were responsible for facilitating the sections, so some instructors taught multiple sections of the same course. However, following data screening procedures, one instructor, who taught one section of the course, did not have any student participants included in the final dataset. Participants' ages ranged from 18 to 55 ($M = 19.29$, $SD = 2.85$). They also varied slightly by academic year: 421 first years (76.7%), 99 sophomores (18.0%), 14 juniors (2.6%), 14 seniors (2.6%), and one unsure (0.1%). Students reported their ethnicity as White/Caucasian (81.6%), Black/African American (7.3%), Asian (4.4%), Native American (0.4%), and other (6.2%), with one not reporting (0.1%).

Procedures and Instrumentation

Each semester, course administrators implement a pre/post-test survey design to assess student experiences and learning in their specific course sections. Students complete a survey during the first two weeks of the semester (pretest) and again during the final two weeks of the semester (post-test). Completion of both surveys is integrated into the course as an assignment worth 2% of the final course grade. This procedure is blanketed by an approved IRB protocol; students are required to complete the surveys for a grade, but they may decline consent to have their data included in the research study. The data for the present study were collected from the post-test administered during the final two weeks of the semester. As a result of this assessment process, the data hierarchy is unique in that students' survey responses are nested within their respective instructors; students' observations are not entirely independent from one another and therefore should be controlled in some capacity.

Perceptions of instructor nonaccommodation

In an effort to establish a set of instructor behaviors that students can individually rate as appropriate or inappropriate, a pool of behaviors was established by (a) consulting existing typologies of accommodative and nonaccommodative behavior (e.g., Harwood, 2000; Jones et al., 1994; Speer et al., 2013; Williams et al., 1997); (b) referencing works employing CAT for classroom communication (e.g., Mazer & Hunt, 2008); (c) synthesizing this information alongside known instructional message variables (e.g., immediacy, content relevance); and (d) recognizing that message receivers can perceive nonaccommodation across several dimensions simultaneously (i.e., multimodal accommodation; Giles et al., 1977). This process resulted in a final, 20-item pool. The item-selection decisions were triangulated through conversations with an instructional communication expert. The decision to rely on a small sample of instructor behaviors was also grounded in (a) the need to reduce testing fatigue and attrition that might result from a long item pool and (b) the comprehensiveness of the items in portraying instructor behavior. Participants reflected on the perceived appropriateness of their instructor's behavior using a 9-point scale ranging from *An Inappropriate Amount* (1) to *An Appropriate Amount*

(9). Responses were then reverse-coded so that higher scores indicated greater perceived inappropriate behavior (i.e., greater nonaccommodation), and lower scores represented less perceived inappropriate behavior (i.e., less nonaccommodation). One item ("My instructor used jargon that was tough to understand") was eliminated because of low correlations with other items.

Finally, the remaining 19 items were subjected to an exploratory factor analysis using Mplus v 8.4 (Muthén & Muthén, 2018) with maximum likelihood estimation. As noted by Bolkan et al. (2020), "Exploratory factor analysis in Mplus allows for the comparison of various models with fit statistics to help guide selection decisions" (p. 56). We examined models with solutions ranging from one to four factors, using a clustered design to respect the nested hierarchy of the data. All models were conducted using GEOMIN rotation to permit factors to correlate. Model fit statistics for all extraction procedures are presented in Table 1; evaluations of model fit were based on a combination of (1) chi-square, (2) eigenvalues, (3) factor loadings, and (4) factor interpretability (Sloat et al., 2017).

In general, the results demonstrated improvement in model fit when moving from one and two factor models to three and four factor models. Using cutoff criteria suggested by Hu and Bentler (1999), the model showed support for a four-factor, clustered solution that fit the data well: Steiger–Lind root mean error of approximation (RMSEA) = .029, Bentler comparative fit index (CFI) = .977, Tucker–Lewis index (TLI) = .921, standardized root mean square residual (SRMR) = .012. Nested factor loadings are presented in Table 2. Notably, only two of the four factors had eigenvalues above 1.0, yet each variable successfully loaded above .50 on one primary factor and did not load on any other factor at .30 or more. Ultimately, based on the model fit indices and factor interpretability, we determined that the four-factor, clustered solution best represented the data.[2] The first factor consisted of five items and was labeled *nonaccommodation related to nonverbal responsiveness*. Four items loaded on the second factor, which was labeled *nonaccommodation related to verbal delivery*. Five items loaded on both the third and fourth factors, which were labeled *nonaccommodation related to content knowledge* and *nonaccommodation related to student support*, respectively.

Outcome variables

The abbreviated version of Goodboy et al.'s (2009) communication satisfaction scale was used to measure students' perceptions of their overall communicative satisfaction with

Table 1. EFA model fit indices.

	Group level: between-instructor models (clustered)							
Factors	Parameters	χ^2 (*df*)	AIC	BIC	RMSEA	SRMR	CFI	TLI
1	57	2935.03 (152)	29101.80	29347.36	.118	WI (.063), BT (.000)	.800	.550
2	75	1451.75 (134)	27654.51	27977.62	.080	WI (.033), BT (.000)	.905	.758
3	92	801.552 (117)	27038.32	27434.66	.054	WI (.020), BT (.000)	.951	.856
4	108	424.075 (101)	26692.84	27158.28	.029	WI (.012), BT (.000)	.977	.921

Note. Group level: between-instructor model = MPlus multilevel modeling procedures used to estimate based on two-level nesting structure. Analyses indicate unrestricted between-level structure (Muthén, 1994). AIC = Akaike information criteria; BIC = Bayesian information criteria; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval; CFit = significance (*p*-value) testing that RMSEA <.05; SRMR = standardized root mean square residual; WI = within; BW = between; CFI = comparative fit index; TLI = Tucker–Lewis index. For each chi-square value, $p < .001$.

Table 2. GEOMIN rotated loadings for four-factor nested model.

	Factor			
Survey item	1	2	3	4
Nonaccommodation related to nonverbal responsiveness				
1. Made eye contact with me	.80	.20	−.02	−.02
2. Smiled at me	.94	−.03	−.02	.07
3. Showed enthusiasm	.76	.03	.12	−.01
4. Used gestures to emphasize points	.71	.16	.09	.03
5. Moved around the classroom when speaking	.59	.07	.04	.17
Nonaccommodation related to verbal delivery				
1. Used slang that I would use	−.04	.76	.12	.01
2. Concentrated on articulating words for clarity	.04	.88	−.03	.09
3. Tried to use simple language	.10	.70	.20	−.05
4. Made an effort to pronounce words correctly	.04	.81	.02	.08
Nonaccommodation related to content knowledge				
1. Provided feedback to me	.01	.06	.59	.26
2. Incorporated examples to make course content relevant	.08	.18	.65	.05
3. Explained course content thoroughly	.01	.04	.88	−.00
4. Simplified course content for me	−.06	.21	.77	.03
5. Repeated his/her ideas to help me understand	.15	−.04	.82	.01
Nonaccommodation related to student support				
1. Provided emotional support	.13	.10	−.05	.76
2. Made me feel comfortable	.22	−.05	.29	.50
3. Was concerned about my success in the class	.06	−.03	.14	.77
4. Was responsive to my needs	−.06	.03	.01	.97
5. Empathized with me	−.02	.05	.05	.87

Note. Eigenvalues are: (1) 13.793, (2) 1.304, (3) .737, (4) .477. Underlined factor coefficients show acceptable factor loadings for the corresponding items and factors. Items that are not underlined did not load on the corresponding factor.

their instructor. This version consists of eight items and has demonstrated good reliability across a range of studies. Participants were asked to reflect on their communication with the instructor using a Likert-type scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (7). The items were averaged to form the communication satisfaction scale, with higher values indicating greater satisfaction.

Rapport was operationalized using Frisby and Myers' (2008) adapted version of Gremler and Gwinner's (2000) measure of rapport. The instrument consists of 11 items measuring students' enjoyable interaction (six items, e.g., "My instructor relates well to me") and personal connection (five items, e.g., "My instructor has taken a personal interest in me") with their instructor. Responses were collected using a 5-point Likert scale from *Strongly Disagree* (1) to *Strongly Agree* (5). The items were averaged to form the instructor rapport measure, with higher values indicating greater rapport.

Processing fluency was operationalized using Dragojevic et al.'s (2017) processing fluency scale. The measure consists of three items reflecting the ease or difficulty experienced when processing information ("My instructor was easy to understand, clear, comprehensible"). Responses were collected using a 7-point scale ranging from *Not at all* (1) to *Very* (7). The items were averaged to form a measure of information processing, with higher scores indicating greater fluency.

Control variables

When analyzing nested data, Raudenbush and Bryk (2002) called for control of individual-difference variables to produce more accurate estimates of the quality of experiences and more generalizable results about the equity of outcomes. Therefore, student sex was

included as a control variable. Students responded to one item assessing their biological sex. The final sample included 188 men, 359 women, and two who preferred not to mention. Those who did not report sex were excluded from the analysis.

Research has also demonstrated that success or failure when it comes to a task influences an individual's perception of whether behavior is considered nonaccommodative (Gasiorek & Dragojevic, 2018). Thus, students' psychological expectations for success or failure could construe their perceptions. Consistent with the teacher course evaluation system at the institution where data were collected, students reported their expected grade in the course on a scale ranging from 1 = *Expecting an A* to 5 = *Expecting an F*. In total, 430 students expected to receive an A (78.3%), 100 students expected a B (18.2%), 15 students expected a C (2.7%), two students expected a D (0.4%), zero expected to fail, and two did not report (0.4%). Those who did not report their expected grade were excluded from the analysis. Responses were dummy coded into a series of dichotomous variables, with those students expecting an A serving as the reference variable.

Additionally, following recommendations by Goodboy and Martin (2020), we utilized Hayes and Coutts' (2020) OMEGA macro to calculate McDonald's omega (ω) in place of Cronbach's alpha (α) for reliability. Utilizing the HA method (see Hancock & An, 2020), composite reliability for each subscale was calculated with 95% confidence intervals using 10,000 bootstrap resamples. Means, standard deviations, reliability using McDonald's omega, and the coding used for the controls are presented in Table 3.

Data analysis

Consistent with the nested structure imposed by the procedures, data were analyzed using hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002). A two-level HLM examined the effects of perceived nonaccommodation (level one predictors; N = 549) nested within instructors (level two grouping; N = 16) while controlling for student characteristics that may bias the sample (e.g., sex, expected grade). Separate analyses were conducted for each outcome using Hierarchical Linear Models software (HLM8; Raudenbush et al., 2019).

Table 3. Means and standard deviations for predictor, outcome, and control variables.

Variable	*M*	SD	ω	95% CI
Classroom Outcomes				
Satisfaction	6.09	0.83	.922	.943, .965
Instructor–Student Rapport	3.96	0.75	.952	.944, .958
Processing Fluency	6.55	0.81	.965	.942, .981
Student Perceptions (Predictor Variables)				
NA related to nonverbal responsiveness	2.18	1.50	.955	.943, .965
NA related to verbal delivery	2.21	1.44	.939	.924, .952
NA related to content knowledge	2.02	1.42	.955	.942, .965
NA related to student support	2.08	1.54	.964	.955, .972
Student-level Controls				
Sex (Dichotomous: 0 = men; 1 = women)	0.66	0.48	–	–
Expected Grade in Course (Dummy-coded):				
Expecting a D (0 = Any other grade; 1 = D)	0.00	0.06	–	–
Expecting a C (0 = Any other grade; 1 = C)	0.03	0.16	–	–
Expecting a B (0 = Any other grade; 1 = B)	0.18	0.39	–	–

Specifically, each analysis occurred in three phases. The first phase (Model 1) involved construction of the null model, which contains no predictors, to assess whether level two groups differed on the average value of each outcome. The null model also partitions variance into both student and instructor components. In the second phase (Models 2–9; the parsimonious model), the predictors and control variables were tested one at a time in sequential models. Given that the hypotheses focus solely on the effects of the student-level predictors, all variables were treated as fixed (i.e., effects applied equally across instructor groupings; Raudenbush & Bryk, 2002).[3]

In the third phase (Model 10), significant level one variables were evaluated simultaneously to see whether effects persisted when controlling for other variables in the model (i.e., the full model); the effect of the predictor variables was adjusted for the shared effect of all variables (Ma et al., 2008). Finally, variance accounted for by the predictor variables (i.e., pseudo R^2) was calculated by comparing the variance in both the null and full models (Woltman et al., 2012). The null represents the amount of variance that could be explained, while the variance from the full model suggests the amount of variance that the researcher has not yet explained. For an overview of HLM procedures in communication research, see Hayes (2006).

Results

Correlations between study variables are presented in Table 4. Perceptions of nonaccommodation related to nonverbal responsiveness, verbal delivery, content knowledge, and student support served as predictor variables (with higher scores representing greater perceived nonaccommodation). Sex and expected grade were controls, and satisfaction, rapport, and processing fluency were outcome variables. Prior to the analysis, predictors were grand-mean centered (see Kreft et al., 1995); raw scores were transformed by subtracting the sample mean. This aided in the interpretability of HLM parameters by rescaling predictor variables, so *B* represents the average change in the outcome when the predictor increases by one unit. Moreover, the intercept becomes the mean for a participant with perceived nonaccommodation equal to the sample average.

Hypothesis 1

H1 predicted that students who perceive more instructor nonaccommodation would report less communication satisfaction. Results for all analyses are presented in Table 5. The null model (Model 1) revealed that variance in satisfaction attributable to

Table 4. Correlations among predictor and outcome variables (one-tailed).

Variable	1	2	3	4	5	6
1. Satisfaction	–					
2. Instructor–student Rapport	.72*	–				
3. Processing Fluency	.55*	.51*	–			
4. Nonverbal Responsiveness	−.40*	−.41*	−.40*	–		
5. Verbal Delivery	−.33*	−.31*	−.39*	.82*	–	
6. Content Knowledge	−.45*	−.41*	−.48*	.79*	.82*	–
7. Student Support	−.50*	−.47*	−.45*	.79*	.77*	.89*

$p < .05$.

Table 5. Parameter estimates for 10 models examining the relationship between perceived nonaccommodation and communication satisfaction.

		Communication satisfaction										
		Null	Parsimonious									Full
Model		1	2	3	4	5	6	7	8	9		10
Intercept	γ_{00}	5.99* (.10)	6.04* (.09)	6.02* (.09)	6.01* (.08)	6.02* (.08)	6.01* (10)	5.99* (.10)	5.99* (.10)	5.99* (.10)		6.03* (.08)
Student Variables												
1 (NV)	γ_{10}		−0.20* (.02)									–
2 (Verb)	γ_{10}			−0.17* (.02)							γ_{10}	0.08* (.03)
3 (Con)	γ_{10}				−0.24* (.02)							–
4 (Supp)	γ_{10}					−0.25* (.02)					γ_{20}	−0.30* (.03)
Control Variables												
Sex	γ_{10}						0.13 (.07)					–
Exp_D	γ_{10}							0.15 (.55)				–
Exp_C	γ_{10}								0.01 (.20)			–
Exp_B	γ_{10}									−0.29* (.09)	γ_{30}	−0.25* (.08)
Variance of Random Components												
	τ_{00}	0.13714	0.10032	0.11882	0.09385	0.07597	0.14214	0.13803	0.13732	0.13369	τ_{00}	0.08042
	σ^2	0.76725	0.50294	0.52802	0.48657	0.4617	0.57726	0.58961	0.58977	0.57824	σ^2	0.44112

Note. 1 (NV) = NA related to nonverbal responsiveness; 2 (Verb) = NA related to verbal delivery; 3 (Con) = NA related to content knowledge; 4 (Supp) = NA related to student support; Exp_D = Expecting to receive a D; Exp_C = Expecting to receive a C; Exp_B = Expecting to receive a B. * $p < .05$. A dash indicates a nonsignificant effect, and values in parentheses represent the standard error.

students was 0.77 and variance attributable to instructors was 0.14. The intraclass correlation coefficient (ICC) also revealed that 15.16% of the total variance in communication satisfaction was attributable to instructors while 84.84% of the variance was at the student level. Models 2 through 5 provide estimates for the independent effects of the student-level variables. All predictors had significant, independent effects on communication satisfaction.

Model 10 estimates effects adjusted (controlled) for other variables in the model. In addition to the predictors, the significant control variables from Models 6 through 9 were included in the analysis. The effects for nonaccommodation related to verbal delivery ($B = 0.08$, $p < .05$) and nonaccommodation related to student support ($B = -0.30$, $p < .001$) remained significant when controlling for the mean difference in communication satisfaction between the proportion of students who expected to receive a B and the proportion of students who expected to receive an A.[4] The previously significant effects of nonaccommodation related to nonverbal responsiveness ($B = -0.05$, $p = .17$) and nonaccommodation related to content knowledge ($B = -0.08$, $p = .13$) from Models 2 and 4 disappeared in the presence of other effects. Additionally, the full model explained 41.36% of the original variance in communication satisfaction at the instructor level and 42.51% of variance at the student level. H1 was partially supported: perceptions of nonaccommodation related to verbal delivery and student support were significantly associated with communication satisfaction when controlling for other variables in the full model.

Hypothesis 2

H2 predicted that students who perceive more instructor nonaccommodation would report less instructor–student rapport. Results for all analyses are presented in Table 6. Model 1 revealed that variance in instructor–student rapport attributable to students was 0.50 and variance attributable to instructors was 0.08. The ICC also revealed that 14.34% of the total variance in instructor–student rapport was attributable to instructors while 85.66% of the variance was at the student level. All predictors had significant, independent effects on instructor–student rapport (Models 2–5).

According to Model 10, effects for nonaccommodation related to nonverbal responsiveness ($B = -0.08$, $p < .05$), nonaccommodation related to verbal delivery ($B = .10$, $p < .01$), and nonaccommodation related to student support ($B = -0.22$, $p < .001$) remained significant when controlling for other variables in the model. The significant effect of nonaccommodation related to content knowledge from Model 4 disappeared in the presence of other effects ($B = -0.03$, $p = .59$). Additionally, the full model explained 66.73% of the original variance at the instructor level and 20.58% of variance at the student level. H2 was partially supported: all predictors, except nonaccommodation related to content knowledge, were significantly associated with instructor–student rapport in the full model when controlling for other variables in the full model.

Hypothesis 3

H3 predicted that students who perceive more instructor nonaccommodation would report less processing fluency. Results for all analyses are presented in Table 7. Model 1 revealed that variance in processing fluency attributable to students was 0.60 and

Table 6. Parameter estimates for 10 models examining the relationship between perceived nonaccommodation and instructor–student rapport.

		Instructor–student Rapport										
		Null	Parsimonious									Full
Model		1	2	3	4	5	6	7	8	9		10
Intercept	γ_{00}	3.89* (.08)	3.93* (.06)	3.91* (.07)	3.92* (.06)	3.93* (.05)	3.90* (.08)	3.89* (.08)	3.89* (.08)	3.89* (.08)		3.94* (.05)
Student Variables												
1 (NV)	γ_{10}		−0.18* (.02)								γ_{10}	−0.08* (.04)
2 (Verb)	γ_{10}			−0.14* (.02)							γ_{20}	0.10* (.04)
3 (Con)	γ_{10}				−0.19* (.02)							–
4 (Supp)	γ_{10}					−0.21* (.02)					γ_{30}	−0.22* (.03)
Control Variables												
Sex	γ_{10}						0.10 (.06)					–
Exp_D	γ_{10}							−0.07 (.51)				–
Exp_C	γ_{10}								0.13 (.19)			–
Exp_B	γ_{10}									−0.30* (.08)	γ_{40}	−0.22* (.07)
Variance of Random Components												
	τ_{00}	0.08346	0.03781	0.05916	0.05142	0.03372	0.08293	0.08321	0.08474	0.07961	τ_{00}	0.02777
	σ^2	0.49864	0.43731	0.46234	0.42964	0.40675	0.49500	0.49960	0.49898	0.48736	σ^2	0.39600

Note. 1 (NV) = NA related to nonverbal responsiveness; 2 (Verb) = NA related to verbal delivery; 3 (Con) = NA related to content knowledge; 4 (Supp) = NA related to student support; Exp_D = Expecting to receive a D; Exp_C = Expecting to receive a C; Exp_B = Expecting to receive a B. * $p < .05$. A dash indicates a nonsignificant effect, and values in parentheses represent the standard error.

Table 7. Parameter estimates for 10 models examining the relationship between perceived nonaccommodation and processing fluency.

		Processing Fluency										
		Null	Parsimonious									Full
Model		1	2	3	4	5	6	7	8	9		10
Intercept	γ_{00}	6.48* (.08)	6.52* (.06)	6.51* (.06)	6.51* (.05)	6.52* (.05)	6.48* (.08)	6.48* (.08)	6.48* (.08)	6.48* (.08)		6.51* (.05)
Student Variables												
1 (NV)	γ_{10}		−0.20* (.02)									–
2 (Verb)	γ_{10}			−0.21* (.02)								–
3 (Con)	γ_{10}				−0.26* (.02)						γ_{10}	−0.26* (.02)
4 (Supp)	γ_{10}					−0.22* (.02)						–
Control Variables												
Sex	γ_{10}						0.07 (.07)					–
Exp_D	γ_{10}							0.35 (.56)				–
Exp_C	γ_{10}								0.12 (.21)			–
Exp_B	γ_{10}									−0.18* (.09)	γ_{20}	−0.17* (.08)
Variance of Random Components												
	τ_{00}	0.07233	0.03682	0.04669	0.02769	0.02864	0.07372	0.07407	0.07331	0.07104	τ_{00}	0.02730
	σ^2	0.60085	0.51348	0.51182	0.46969	0.49523	0.59354	0.60124	0.60146	0.59789	σ^2	0.46675

Note. 1 (NV) = NA related to nonverbal responsiveness; 2 (Verb) = NA related to verbal delivery; 3 (Con) = NA related to content knowledge; 4 (Supp) = NA related to student support; Exp_D = Expecting to receive a D; Exp_C = Expecting to receive a C; Exp_B = Expecting to receive a B. *$p < .05$. A dash indicates a nonsignificant effect, and values in parentheses represent the standard error.

variance attributable to instructors was 0.07. The ICC also revealed that 10.74% of the total variance in processing fluency was attributable to instructors while 89.26% of the variance was at the student level. All predictors had significant, independent effects on processing fluency (Models 2–5).

Model 10 revealed that only the effect for nonaccommodation related to content knowledge ($B = -0.26$, $p < .001$) remained significant when controlling for other variables in the model. The previously significant effects of nonaccommodation related to nonverbal responsiveness from Model 2 ($B = -.03$, $p = .32$), nonaccommodation related to verbal delivery from Model 3 ($B = .02$, $p = .71$), and nonaccommodation related to student support from Model 5 ($B = 0.01$, $p = .85$) disappeared in the presence of other effects. The full model also explained 62.26% of the original variance at the instructor level and 22.32% of variance at the student level. Thus, H3 was partially supported: nonaccommodation related to content knowledge was significantly associated with processing fluency when controlling for other variables in the full model.

Discussion

This study evaluated whether students' perceptions of instructor nonaccommodation predicted their affective and cognitive outcomes: communication satisfaction, instructor–student rapport, and processing fluency. Although researchers have previously contributed to this thinking through investigations of inappropriate or poor teaching behaviors, CAT presents a new framework for understanding how varying interpretations of behaviors influence classroom outcomes. Three conclusions can be drawn from the results.

First, the method used to assess nonaccommodation in the current study, while exploratory, uniquely contributes to CAT literature while remaining consistent with various approaches that have been used to assess adjustment across other contexts. When assessing adjustment, researchers have previously asked for perceptions of behavior that reflect contextual features. Past research suggests the context of an interaction influences perceptions of adjustment, and instructors, like other roles (e.g., police officers; Dixon et al., 2008), behave in ways unique to their occupation, setting, and interactional goals. The current procedure reflects this notion by highlighting behaviors inimitable to the instructional setting (e.g., my instructor incorporated examples to make course content relevant) that contextualize interactions appropriately. This contextualization also includes items that gauge the extent to which instructors who engage in support-related behavior (e.g., "My instructor was concerned about my success in the class") as a means of helping students meet various classroom goals can be seen as appropriate or inappropriate. The items ultimately indicate that students can perceive instructors as nonaccommodative across a variety of behaviors and situations, which we believe should prompt scholars to conduct future investigations of adjustment within specific classroom circumstances or interactions. Additionally, in pursuit of this endeavor, we also encourage scholars to replicate the proposed 4-factor structure and provide tests against competing measurement models to aid in the overall validity of the instrument.

Second, when controlling for other variables in the model, perceptions of nonaccommodation related to nonverbal responsiveness and student support resulted in decreased communication satisfaction and instructor–student rapport.[5] On one hand, it is possible

that the relatively high mean scores for perceptions of nonaccommodation influenced this result. Students generally found that their instructors behaved appropriately and in line with their expectations across the sample. Yet, since there was an observed effect for behaviors that deal primarily with the instructor–student relationship, it may be that slight departures away from optimal levels of appropriateness in these areas have a significant influence on outcomes. Contrarily, the strategies an instructor might use to ensure students are understanding and retaining content may require larger deviations away from students' expectations of appropriateness in order to produce a significant effect. Students may be less tolerant of inappropriate nonverbal and support-related behaviors than they are of behaviors intended to ensure they develop content knowledge.

On the other hand, it is also possible that the results are being driven by a general lack of variance in perceived inappropriate behavior. If there was greater variation in students' perceptions of the inappropriateness of the instructors, there is a possibility that nonaccommodation related to content knowledge might also have significantly affected both satisfaction and rapport when modeled simultaneously. Until more research is conducted to assess the current results in a context where greater variance in inappropriate behavior can be assessed, the finding should be interpreted with care.

Third, perceptions of nonaccommodation related to content knowledge resulted in less processing fluency when controlling for other variables. This is not entirely surprising, given that CAT suggests that a failure to adapt communication in accordance with a listener's needs leads to difficulties in comprehension (Gasiorek, 2015). Essentially, nonaccommodation may occupy cognitive resources that students need to encode knowledge, making information more difficult to process. However, this idea must be interpreted in tandem with the control of students' expected grade. Gasiorek and Dragojevic (2018) found that task success influenced retrospective accounts of nonaccommodation, specifically referencing how students who perform well may be more likely to perceive instructors as accommodative. Thus, it makes sense that the abundance of high achievers in this sample viewed instructors favorably and felt they processed material more fluently. Yet, students still felt that nonaccommodation related to their course progression decreased fluency irrespective of their psychological expectation for success. Perhaps in this study, where achievement was not defined by the tangible completion of a singular task but rather by cumulative experience within a course, the relationship between perceptions of nonaccommodation and success is less defined. Future research should examine the influence of nonaccommodation following a specific learning task (e.g., an exam) or by measuring expected success linearly to further define this idea in context.

Taken together, the three full models raise questions concerning how nonaccommodation in a classroom setting occurs across multiple modes simultaneously (i.e., multimodal accommodation). In addition to the notions that greater variance in inappropriate behavior or perceptions of nonaccommodation related to specific learning tasks might produce varying effects, research is still unclear as to how students respond and react to various modes of nonaccommodation occurring at the same time. The results suggest that nonaccommodation had both unimodal and bimodal effects, depending on the outcome in question (see also Gnisci, 2005; Gnisci & Bakeman, 2007). When perceptions of adjustment are expanded to occur across multiple modes, specific types of nonaccommodation may drive unique effects compared to others. Perhaps students

begin to prioritize the appropriateness of individual teaching behaviors that they feel put them in the best position to meet their goals in context (Goldman et al., 2017; Mottet et al., 2006). Said another way, students may feel that instructors often adjust their behavior inappropriately; however, depending on their interactional goals in the classroom, the appropriateness of certain behaviors may take precedence in their minds over others. In any case, the study provides researchers with a roadmap for continuing to investigate how multiple modes of nonaccommodation conjointly impact students' instructional experiences.

Practical implications

The findings hold important implications for classroom pedagogy. The results reinforce that perceived inappropriate communication by instructors can have an adverse influence on students. When instructors are perceived to behave inappropriately, students may feel less satisfied, which can ultimately impede their ability to learn (Goodboy et al., 2018). Even slight departures away from appropriate behavior that would otherwise help students succeed in a course can negatively impact affective experiences (Borzea & Goodboy, 2016). Aa a result, instructors need to be able to effectively differentiate between situations where students might desire more or less of a particular behavior (e.g., they need a more detailed explanation or they received too much feedback) and situations where students are content with the level of interaction. As Knoster and Goodboy (2021) indicated, instructors who spend time relating content to students' needs (i.e., accommodating) improve both course affect and learning. Such training could involve quick methods that do not markedly obstruct important instructional time like how to construct brief questionnaires where students can articulate their needs, how to informally gauge the appropriateness of their classroom behaviors, or how to actually adapt pedagogy to appeal to a wider variety of student interests and goals.

Likewise, instructors should be mindful that students can perceive certain behaviors as inappropriate relative to their needs, which could mean an instructor is undercompensating (not meeting expectations) or overcompensating (overshooting expectations). In turn, these perceptions can influence their instructional experiences. For example, research suggests that instructors can deliberately avoid presenting students with redundant information across multiple sources (i.e., the redundancy principle; Sweller et al., 1998) to improve information processing. The use of more clarity strategies to elucidate learning principles (see Bolkan et al., 2016) may in fact only be useful up to a certain threshold, at which point a student may perceive the instructor to be nonaccommodative and subsequently redundant. Accordingly, when instructors think they are providing a wealth of information to students in order to help them achieve their classroom goals, they may actually be overshooting students' needs for clarity or direction (Gasiorek & Giles, 2012). In a classroom, this means it might be helpful for instructors to break information into smaller parts instead of presenting information all at once (Bolkan, 2019). Segmenting information in this manner may allow instructors to assess the conditions when students need more information, have had enough to understand and apply concepts, or have received too much information to the point where it becomes inappropriate.

Limitations and future research

The results of this study should be interpreted within the scope of the limitations. As noted, the descriptive statistics included in Table 2 suggest that all instructors responsible for teaching the course excelled in students' reports of each outcome. This is a positive finding for the status of the basic communication course being assessed, but it also suggests minimal variation among variables. The results may be statistically significant, they may lack social significance in that students experienced very positive outcomes amidst nonaccommodation. Essentially, it remains unclear whether perceived nonaccommodative instructors are truly more ineffective than accommodative instructors or whether these small effects may have substantial impact over time.

Next, the decision to select 20 items to represent the universe of instructor behavior limits the overall content and face validity of the included measure. The construction of the measure was exploratory in nature, and it is highly likely that instructors adjust to students using several different behaviors or across several different modes not included in the research. Although the chosen behaviors are grounded within the larger framework of instructional communication and CAT literature, a qualitative analysis or grounded study may reveal insight into the prominence of the behaviors chosen relative to students' perceptions or highlight new behaviors that were overlooked when constructing the measure.

Third, depending on the research questions under consideration, the exact nature of the multilevel framework can lead to significant changes in the overall structure of the data hierarchy. The decision to specific levels within an analysis is ultimately an epistemological choice (Hayes, 2006), and it can take multiple forms depending on the researcher's primary interest. In the current study, the choice to construct a two-level model of students nested within instructors resulted in two specific limitations that warrant mention: (1) exclusion of a third level of the data hierarchy and (2) a small sample of level two units ($N = 16$). It is entirely feasible to construct separate models where the data hierarchy consists of a different two-level model (students within course sections) or three-level model (students within instructors within course sections) that more comprehensively capture known sources of error variance. In addition, because HLM is a large sample procedure, a small number of units included at level two may reduce the statistical power needed to detect significant effects and influence the accuracy of estimates (Hox & McNeish, 2020).

Last, random effects were not included in this research. By treating all of the predictors as fixed in the HLM, the research eliminates the possibility of observing effects that vary differently depending on the second-level grouping. Instead, analyses assume that effects apply equally across all instructors. If students are perceiving their instructors to behave with similar levels of appropriateness, yet they are still reporting various levels of outcomes, there may be a problem in the overall equity of instructor effort. That is, some instructors may be more nonaccommodative to students, yet they may have less of an impact on students' experiences than other instructors who are less nonaccommodative. Including theoretical predictors at the second level of the proposed HLMs—instructor race, instructor age, overall course climate, length, format, composition, or time of day (e.g., morning, afternoon, evening)—might also reveal important contextual effects that could add precision to relationships among study variables. For example, studies

suggest that instructor characteristics or behavioral traits influence satisfaction (e.g., Sidelinger et al., 2015). At a contextual level, it may be that the relationship across instructors depends to some extent on this influence. Future research should consider treating study variables as randomly varying to gain more insight into the possibility of instructor-level effects.

Ultimately, the theoretical and practical implications forwarded herein offer exciting next steps for instructional communication and CAT researchers. CAT, a prominent and established theory of communication adjustment, appears to be a useful framework for understanding students' perceptions of their instructor's behavior. Moreover, the notion that instructor behaviors can serve different functions for students paves the way for researchers to rethink the complexities of classroom communication. Behaviors may not function as linearly or definitively as previously conceptualized, and CAT presents a clear opportunity to advance the discipline by forwarding new knowledge claims about what constitutes effective classroom communication. Communicative adjustment is and will continue to be a fundamental component of human interaction, and scholars should reflect this principle both within and across academic settings.

Notes

1. The original sample consisted of 554 participants. However, five participants were identified as multivariate outliers and were excluded from all analyses (Tabachnick & Fidell, 2013).
2. Guided by recommendations from Carpenter (2018), we also generated a single-level, randomized parallel analysis ($n = 1000$) that further identified latent factors. The results suggest that student perceptions of nonaccommodation may function as a single latent factor with the addition of a second factor (eigenvalue = 1.304) not larger than expected by chance. Thus, the parallel analysis suggests that future testing using confirmatory factor analysis (CFA) procedures may be needed to assess the possibility of a bifactor structure representing general perceptions of inappropriateness.
3. For the second phase (Models 2–9), the error terms for all predictors were treated as fixed, as the presence of random effects were not included as part of the study's hypotheses (Ma et al., 2008; Raudenbush & Bryk, 2002). These error terms can be treated as random (i.e., assuming effects vary across level-two groupings) if (a) theory supports this decision or (b) the data reveal random effects to be present. As noted by Hayes (2006), the assumption of random effects "can always be tested, and if the data are inconsistent with this assumption, the model can be reestimated setting the effect to fixed" (p. 389).
4. As indicated by Tables 5–7, comparisons to grades other than A or B yielded nonsignificant results.
5. Notably, Tables 5–7 show that the effect of nonaccommodation related to verbal delivery on processing fluency disappeared when included alongside other variables; however, related to students' satisfaction and rapport, the negative, individual effect reported in the parsimonious model changed direction entirely. This result was unexpected, and it is possible that the finding was merely a statistical artifact. Although the items used to assess this dimension of instructor nonaccommodation may be reflective of some instructor behaviors, the notion of instructor speech may be much more complex than what was captured in the current study. There may be intergroup differences or similarities in language use and expectations between instructors and students not represented in the research (Hosek & Soliz, 2016). For example, the general demographics of the instructors at the respective institution do not lend themselves to vast differences in verbal/linguistic behavior. The 17 instructors who were responsible for teaching the course were overwhelmingly white, female, and Caucasian. These characteristics are similar to the general demographic

composition of the respondents for the survey. Thus, it seems reasonable that instructors' use of slang, pronunciation, articulation, or language was already close to what the students might use themselves, and it is unclear whether this reversal in effect would be sustained when using a scale that better captures variability in perceived nonaccommodation related to verbal delivery.

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