Change in self-perceptions of communication competence: A comparative analysis of differences across gender and class rank (year of study)

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Abstract

This investigation proposes a systematic conceptualization of change in self-perceived communication competence (SPCC). The hypothesized model of change is tested using three waves of data from 705 undergraduate students enrolled in a core curriculum course at a U.S. university. This research offers valuable information for pedagogical practice by contrasting patterns of change of females and males. In addition, the study investigates whether interaction between sex and class rank (year of study) is associated with different types of SPCC trajectories.

Self-perceived communication competence (SPCC; McCroskey & McCroskey, 1988) is a construct that impacts communication encounters in important ways for perceptions of skill(s) matter more than actual skill(s) when people make decisions about communicating (McCroskey, 1997; McCroskey & McCroskey, 1988; McCroskey & Richmond, 1990; Richmond & McCroskey, 1995) and affect people's communicative performance across various communication contexts (Ford & Wolvin, 1993). The salience of SPCC for the teaching and learning process cannot be underestimated, as the construct impacts academic success and has a close relationship with persistence to remain in college (Hawken, Duran, & Kelly, 1991; Rubin & Graham, 1988; Rubin, Graham, & Mignerey, 1990).

Creating in a classroom an environment in which students feel competent enough to engage in communication is likely to be beneficial, for this setting could promote a more active participation of students in class activities and learning (MacIntyre, Babin, & Clement, 1999; McCroskey, 1997). This aspect is pivotal for all students but especially so for at-risk students who do not perceive themselves as competent (Rosenfeld, Grant, & McCroskey, 1995). Therefore, it appears that communication courses need not only to enhance students' communicative ability but also to boost their confidence that they possess all skills needed to be successful in the given class (Dwyer & Fus, 2002; Richmond & McCroskey, 1995). Moreover, it is important for educators to take into account that through instruction and schooling people change.

The need for a precise conceptualization of change

The process of change is a fundamental component of people's educational experiences: Whenever individuals learn or acquire new skills, develop attitudes and interests, they change as well (Willett, 1994). In particular, for college students, participation in courses and the associated exposure to instruction is expected to enhance both the desire to engage in communication encounters and the ability to do so successfully (Rubin et al., 1990; see also Pearson & Daniels, 1988). Thus, to appropriately assess students' progress and evaluate how effective educational systems are, one needs to measure change accurately (Willett, 1994). More specifically, because "communication processes and their influence on people as individuals and on collectivities are dynamic and unfold with time" (Henry & Slater, 2008, p. 55), researching them accurately requires an extension of theoretical conceptualizations and empirical investigations beyond a pre-post framework (Nesselroade, Stigler, & Baltes, 1980).

Limitations of extant communication research targeting SPCC

Whenever a precise conceptualization of change is used, "substantial gains in insight regarding underlying processes and mechanisms of communicative influence" (Henry & Slater, 2008, p. 58) can be achieved. However, with respect to SPCC, three significant problems plague current communication literature. First, although the construct was conceptualized more than 20 years ago (McCroskey & McCroskey, 1988) this work is the first one to offer a systematic conceptualization and study of its development across time. Second, most previous research accounts analyzing SPCC relied on a cross-sectional framework of inquiry to explicate relationships between the construct and its hypothesized predictors (e.g., MacIntyre, 1994; MacIntyre et al., 1999). This approach is problematic because cross-sectional models incorrectly posit simultaneous occurrence of cause(s) and effect(s) and, thus, produce "biased estimates of longitudinal direct effects" (Maxwell & Cole, 2007, p. 29). In contrast, studying the focal construct in a longitudinal framework (as this work does) enables a proper investigation of the dynamic relationships among variables/constructs and facilitates a better understanding of why certain outcomes are likely to occur given specific inputs (Ployhart & Vandenberg, 2010).

Third, all extant works following SPCC (or its dimension(s)) across time (e.g., Dwyer & Fus, 2002; Rubin, Rubin, & Jordan, 1997) have serious methodological problems. More precisely, they did not account for measurement errors and did not study change appropriately for they either lacked sufficient information (i.e., data was collected at only two time points, e.g., Rubin et al., 1997) and/or utilized statistical techniques that failed to take into consideration inter-individual differences in time-related change (e.g., Dwyer & Fus, 2002; Rubin et al., 1997).

Goals of the study

This research proposes and tests a systematic conceptualization of change in SPCC scores associated with respondents' (i.e., students') participation in an introductory communication course focusing mainly on public speaking. The second goal of this work is to assess whether differences in students' SPCC trajectories can be detected along the masculine-feminine dimension (Shepherd, 1992). To this end, specific comparisons are conducted between change patterns for female and male subgroups. The final objective of the study is to use this research as a motivating example to show that in certain situations failing to test the underlying assumption that a sample is homogeneous with respect to a construct of interest can generate incomplete conclusions in assessments of intervention effects.

Theoretical perspective

This study employs McCroskey and McCroskey's (1988) conceptualization that regards SPCC as gauging "subjects' perceptions of their communication competence" (McCroskey & McCroskey, 1988, p. 111) across four areas of communication (i.e., public speaking , talking in a large meeting, in a small group, and in a dyad) and three types of receivers (i.e., friends, acquaintances, and strangers).

The masculine and feminine dimensions of communication

Canary and Hause (1993) posited that "sex-differences in communication do exist" (p. 139) but might be obscured by the way in which sex is conceptualized and operationalized in research. Along the same lines, grounded on Gilligan's (1982) work on moral development, Shepherd (1992) argued that the bi-dimensional structure characterizing the moral domain (i.e., social power and masculinity on one hand, interchange and femininity on the other) is paralleled by a two-dimensional (i.e., masculine and feminine) conceptualization of communication. A feminine orientation regards communication from a standpoint that values building and maintaining relationships, rather than simply treating it as an influence-exerting or disseminating instrument (Condit, 2006; Shepherd, 1992). On a similar note, McCroskey and Richmond (1996) termed the two main orientations of communication as rhetorical and relational.

The masculine and feminine perspectives rely on rather divergent assumptions regarding the main goals of communicative interactions (i.e., influence and relationship, respectively; Boster, 2006; Condit, 2006) and reflect different cultural orientations (i.e., individualism and, respectively, collectivism; McCroskey & Richmond, 1996). The choice of perspective that is primarily embraced when conceptualizing communication is extremely consequential for it determines the definitional attributes of communication competence. In particular, in a feminine orientation, competence is rooted on a "transactional and coorientational perspective" (McCroskey & Richmond, 1996, p. 234), whereas in a masculine view communication competence is defined around the ability to influence

others and avoid being influenced by them (Shepherd, 1992). In light of these theoretical accounts that posit differences in communication styles and assumes them to be sex-related, it is important to actually test whether female and male do exhibit different patterns of communicative behaviors with respect to self-perceived communication competence. Moreover, because extant communication research has been relying almost exclusively on cross-sectional and pre-post research designs (see the discussion in the following section), it has not been able to address salient issues pertaining to SPCC: Is the construct changing across time? If so, do female and male exhibit similar or different trajectories of change? These are aspects that the current research addresses.

Proposed conceptualization of change

This study proposes the following model of 'change over time' for total SPCC (TO SPCC) scores: *TO SPCC levels increase linearly over the course of a semester*. We use in this study TO SPCC to denote the total score of the instrument with the same name (McCroskey & McCroskey, 1988). This notation affords a clear distinction between total scale (i.e., TO SPCC) and subscale scores. To test the proposed conceptualization of change, a longitudinal nonexperimental design (Campbell & Stanley, 1966) comprised of data collected at three time points is employed. To test the proposed conceptualization of change and examine in detail the time-related evolution of TO SPCC scores the following research hypotheses and research question are tested:

- *Research Hypotheses (RH)1*: TO SPCC scores increase linearly over the course of a semester for a population of undergraduate students enrolled in a core curriculum communication course.

- *Research Hypothesis (RH) 2*: Patterns of change in TO SPCC are different for female and male participants.

- *Research Hypothesis (RH) 3*: Patterns of change in TO SPCC are not different for first- and other-than-first-year students.

- *Research Question (RQ) 1*: Is the interaction between sex and class rank associated with differences in time-related evolution in TO SPCC?

Method

Participants

Data for this study was collected from a sample of undergraduate students enrolled in a core curriculum communication course (emphasizing public speaking) at a U.S. university. A number of 706 students participated in the study (59.48% response rate). With the exception of one participant who did not respond to any SPCC item and, thus, could not be included in the analyses, the study

used data from all students (bringing the sample size to *N* = 705). Three hundred and nineteen participants (45.18%) were females, and 523 (74.08%) were first-year students.

Procedure

After the study was reviewed and approved by the University's Institutional Review Board, all 1187 students who were enrolled in the course were invited to participate. The data collection included three measurement waves (i.e., in the first, eight, and 15th week of the semester) chosen so that no students performed public speeches prior to the first administration of the instrument, but all students delivered at least one public speech before the second measurement and an additional one prior to the last data collection point. All instructors who taught the course in the given semester were contacted, informed, and asked for voluntary cooperation to administer the questionnaires during class time.

Measures

This instrument (McCroskey & McCroskey, 1988) assesses SPCC in four contexts (communication in dyads, communication in a large group of people, communication in a small group of people, public speaking) and with respect to three types of receivers (strangers, friends, and acquaintances). The instrument consists of 12-items assessing respondents' perception of their communication competence (see appendix A). The items are scored on a 0-100 scale where 0 means "not at all competent" and 100 means "totally competent".

Measures of students' SPCC scores (McCroskey & McCroskey, 1988) were collected three times during one semester. Individual items, subscale (i.e., context) scores, and total score were recorded/calculated on a scale ranging from 0 (i.e., 'completely incompetent') to 100 (i.e., 'completely competent'). The characteristics of the sample are summarized in Table 1.

Data analytic technique

To test RH1-RH3 and answer to RQ1 latent growth modeling (LGM) is employed. LGM is "a very general data analytic system for repeated measures designs which incorporates paired *t*-tests, repeated measures ANOVA, and MANOVA as special cases" (Voelkle, 2007, p. 378). LGM takes into account the underlying theory of change (Ram & Grimm, 2007) and models both mean differences and individual patterns of evolution (Voelkle, 2007). The appropriateness of any proposed latent growth model is gauged by employing a variety of fit indices: values of .95 and higher for CFI and TLI were used as benchmarks for good fit, while for RMSEA values below .05 were taken to indicate a very good fit (see Bollen & Curran, 2006; Hu & Bentler, 1999).

Table 1: Full information maximum likelihood estimates of observed sample statistics for overall model

Variable	TO SPCC1	TO SPCC2	TO SPCC3
1.TO SPCC1	**258.15**	.47	.54
2.TO SPCC2	111.62	**218.11**	.62
3.TO SPCC3	132.10	140.51	**233.51**
Mean	74.94	77.66	79.05
Skew	-1.18	-1.22	-1.01
Kurtosis	2.30	2.78	1.34
Reliability	0.90	0.90	0.91

Note. Variances are denoted in bold, covariances are included in the lower triangular part, and correlations are in the upper triangular part of the table. TO SPCC1-3 = average scores for the entire scale at times 1-3; Reliabilities reported in this table are the α coefficient of internal consistency.

Results

An examination of Table 1 reveals that at all time points TO SPCC scores had excellent reliabilities (i.e., 0.90 and higher) and small absolute values of skewness and kurtosis. This study made use of maximum-likelihood (ML) estimation procedures that have been shown to be robust with respect to small and medium violations of normality assumption (Fan & Wang, 1998). All analyses conducted in this research employed Mplus version 5.2 (Muthen & Muthen, 1998-2007).

The LGM model that fit best TO SPCC scores had homoscedastic error structure and included correlated errors for the first two waves of measurement. As illustrated in Table 2, this overall (i.e., OV) model, which does not separate data in groups, had an excellent fit. Therefore, these results offer empirical support for RH1 and show that the proposed conceptualization of linear change is appropriate for TO SPCC scores.

Table 2: Values for the Chi-Squared Tests and Goodness-of-Fit Indices for Overall and Multiple-Group Latent Growth Models of Total SPCC

Model	$\chi^2(df, N); p$	CFI	TLI	RMSEA (90% CI)
OV	$\chi^2(2, N = 705) = 1.29; p = .53$	1.00	1.00	.00 (.00, .07)
BMG	$\chi^2(4, N = 705) = 6.82; p = .15$	0.99	0.99	.04 (.01, .10)
IMG	$\chi^2(5, N = 705) = 7.20; p = .21$	1.00	0.99	.04 (.00, .09)
ISMG	$\chi^2(6, N = 705) = 14.27; p = .03$	0.98	0.98	.06 (.02, .11)

Note: CFI=Comparative Fit Index. TLI=Tucker and Lewis non-normed fit index. RMSEA=Root Mean Square Error of Approximation. CI = confidence interval. OV = overall model (i.e., a model combining female and male subsamples). BMG = baseline multiple-group model (i.e., a model that is fit simultaneously to the female and male subsamples but imposes no equality constraints across these two groups). IMG = intercept multiple-group model (i.e., a model that is fit simultaneously to the female and male subsamples and posits equal average initial levels for female and male subsamples). ISMG = intercept and sample multiple-group model (i.e., a model that is fit simultaneously to the female and male subsamples and posits equal average initial levels and rates of change for female and male subsamples).

Next, a detailed discussion of the parameter estimates of this overall LGM model (summarized in the first row of Table 3) is included. The estimated means of the intercept ($\mu_{ci\_OV} = 75.25$) and slope ($\mu_{cs\_OV} = 4.02$) latent factors were both significantly different from zero (see Table 3) showing that, for the overall population, the average true TO SPCC score at the beginning of the semester was 75.25 points, and the estimated mean rate of true change was 4.02 points for the duration of the semester. (For the remainder of this paper, in the interest of brevity, we use initial levels (scores) and, respectively, rates of change to stand for true initial levels (scores) and, respectively, true rates of change.) The fact that the mean of the slope factor was positive and significantly different from zero indicates that there was a systematic (i.e., non-random) increase in students' TO SPCC scores in the given semester.

As it is clear from Table 3, the variance estimates for the TO SPCC intercept and slope factors were significantly different from zero indicating that a substantial interindividual variability existed with respect to both initial levels and rates of change in TO SPCC. This result shows that students were quite heterogeneous with respect to both initial levels and subsequent increases in these levels.

Table 3: Unstandardized Parameter Estimates for Overall and Multiple-Group LGM Models

Sample (*N*)	Average TIS			Average TRC			Variance TIS			Variance TRC			Cov (Corr) of TIS and TRC		
	Estimate	SE	*p*	Estimate	SE	*p*	Estimate	SE	*p*	Estimate	SE	*p*	Estimate	SE	*p*
OV (*705*)	75.25^{**}	0.58	< .01	4.02^{**}	0.63	< .01	180.60^{**}	16.22	< .01	77.75^{**}	21.90	< .01	-51.06^{**} (–.43)	14.96	< .01
F(*319*)	75.22^{**a}	0.58^{a}	< .01	2.45^{**}	0.89	< .01	165.28^{**}	23.56	< .01	52.15	33.24	.12	–22.63 (–.24)	12.91	.29
M(*386*)	75.22^{**a}	0.58^{a}	< .01	5.36^{**}	0.78	< .01	196.00^{**}	22.60	< .01	92.33^{**}	29.08	< .01	-75.91^{**} (–.56)	20.95	< .01
FF(*254*)	74.87^{**b}	0.61	< .01	2.87^{**c}	0.75	< .01	197.41^{**}	26.11	< .01	100.65^{**}	35.12	< .01	-48.11^{*} (–.34)	24.01	.04
FOTF(*65*)	79.16^{**}	1.41	< .01	2.87^{**c}	0.75	< .01	110.39^{**}	31.46	< .01	47.49	36.68	.20	–20.91 (–.29)	26.01	.42
MF(*268*)	74.87^{**b}	0.61	< .01	6.04^{**}	0.92	< .01	188.43^{**}	25.02	< .01	82.23^{**}	30.04	< .01	-75.77^{**} (–.61)	22.60	< .01
MOTF(*118*)	74.87^{**b}	0.61	< .01	2.87^{**c}	0.75	< .01	156.42^{**}	39.14	< .01	20.35	50.55	.69	–18.23 (–.32)	34.25	.60

Note. TIS = true initial status. TRC = true rate of change. Cov = covariance. Corr = correlation. *N* = sample size. SE = standard error. OV = overall. F = female. M = male. FF = female first-year. FOTF = female other-than-first-year. MF = male first-year. MOTF = male other-than-first-year. All *p* values are two-tailed.

$^{*}p<.05.$ $^{**}p<.01.$ ^{a,b,c}*denote parameters held equal across groups*.

In the next step, RH2 is tested to assess whether the observed patterns of change are consistent for both female and male participants. To do so, multiple-group LGM analyses were conducted. In the first step, a baseline multiple-group (i.e., BMG) model was employed. This model imposed no restriction whatsoever and was evaluated simultaneously for female and male subsamples. The model fit the data very well (see Table 2, the line corresponding to BMG) and, thus, provided support toward conducting a multiple-group LGM analysis. In the next step, to test whether female and male subsamples began the semester at similar TO SPCC levels, a more restricted model was utilized. This model posited as its unique restriction that the mean of the latent intercept factor is the same for the female and male subsamples. This model also fit the data well (see Table 2, the IMG line). In addition, the chi-square difference test that permits an evaluation of whether imposing this equality constraint conduces to a significant drop in fit was not statistically significant: $\Delta\chi^2 = 0.38, \Delta df = 1, p = .54.$ This finding indicates that the hypothesis that female and male subgroups began the semester at similar true TO SPCC levels received support from the data.

In the last step of this multiple-group LGM analysis the equality of the mean rates of change across the two groups was imposed and tested. This intercept and slope multiple-group model (ISMG) had a good fit to the data (see Table 2) but the chi-square difference test was significant: $\Delta\chi^2 = 7.07, \Delta df = 1, p < .01.$ Thus, the data provided no support for the hypothesis of equal rates of change in the female and male groups and RH2 was upheld. As a result, the second multiple group LGM model (denoted IMG in Table 2) was deemed acceptable. Findings associated with this model, summarized in Table 3 (the lines denoted with F for the female subsample and with M for the male one) are presented in details.

Comparison of patterns of change across sex- and class-rank-based subsamples

On average, female and male students began the semester at similar levels of TO SPCC but had markedly different evolutions as the semester progressed. As expected, the average trajectory for the overall sample was situated between the trajectories for female and male respondents, thus describing accurately neither of the two subsamples. To further illustrate the magnitude of the difference between average rates of change for males and females, a latent standardized effect size ($\hat{\Delta}$) was estimated following the procedure described in Hancock, Kuo, and Lawrence (2001). Specifically, $\hat{\Delta}$ was defined as the ratio of the absolute value of the difference between estimated average rates of change for male and female subgroups and the square root of the pooled variance of the two groups' rates of change (employing the sample sizes as weights). Using the results in Table 3 $\hat{\Delta}$ can be easily obtained: $\hat{\Delta} = \frac{|5.36 - 2.45|}{\sqrt{\frac{386 * 92.33 + 319 * 52.15}{386 + 319}}} = 0.34$. The value of this estimated latent standardized effect indicates that, on average, the increase in male students' TO SPCC scores was about one-third of a standard deviation steeper than that of their female counterparts.

Following a similar sequence of steps, differences between first-year and second-, third-, and fourth-

year (i.e., other-than-first-year, OTF) students were analyzed. This investigation was conducted to test RH3 and to attempt to identify whether trajectories of change in TO SPCC differ across class rank. Unlike the case of sex, class rank was not associated with significantly different trajectories of TO SPCC, as, on average, first-year and OTF students began the semester at similar levels and increased comparably across time. These findings provide support for RH3.

In the next step a final multiple-group LGM analysis was employed to study whether the interaction between sex and class rank is associated with marked differences in students' time-related evolution in TO SPCC. More specifically, differences in TO SPCC growth trajectories were compared across the four groups resulted from crossing the two levels of sex with the two levels of class rank (i.e., female-first-year (FF), female-other-than-first-year (FOTF), male-first-year (MF), and male-other-than-first-year (MOTF)). Increasingly constrained models were fitted to evaluate whether focal parameters of the growth curves are different across these four subgroups. The most parsimonious model that fits the data well had equal average initial TO SPCC levels for FF, MF, and MOTF and equal average rates of changes for FF, FOTF, and MOTF. The parameter estimates associated with this model are summarized in Table 3 (rows corresponding to FF, FOTF, MF, and MOTF) and Figure 2.

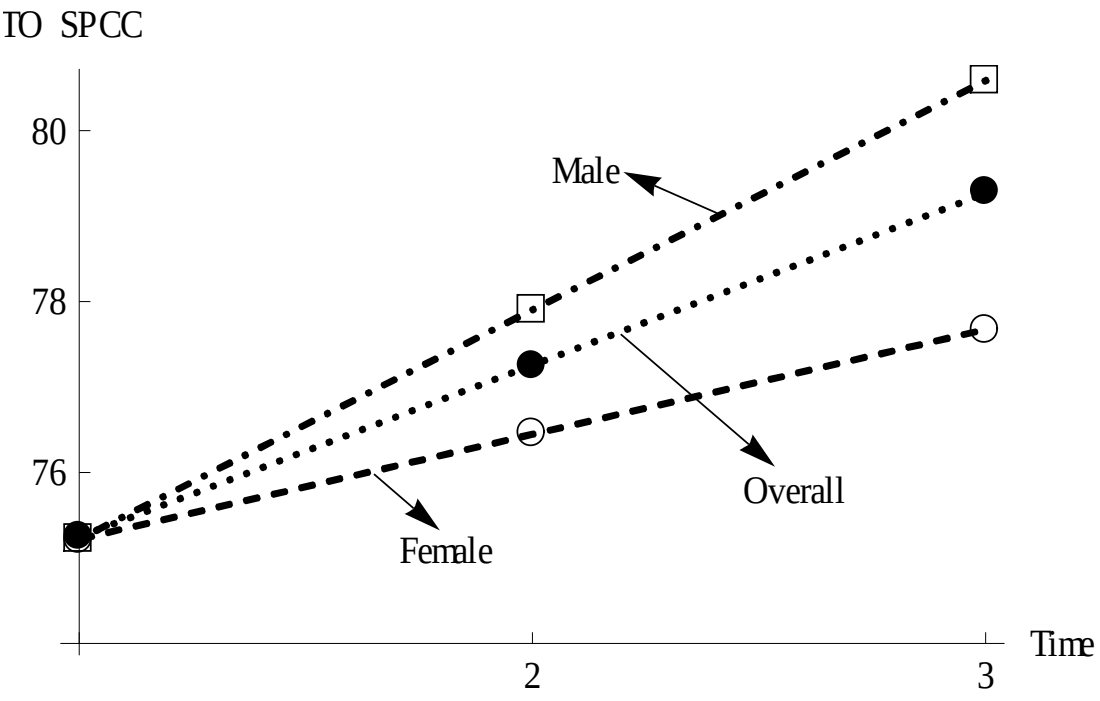

Figure 1: Estimated average growth trajectories for the overall sample, and for the female and male subsamples across the three time points of data collection. TO = total SPCC score.

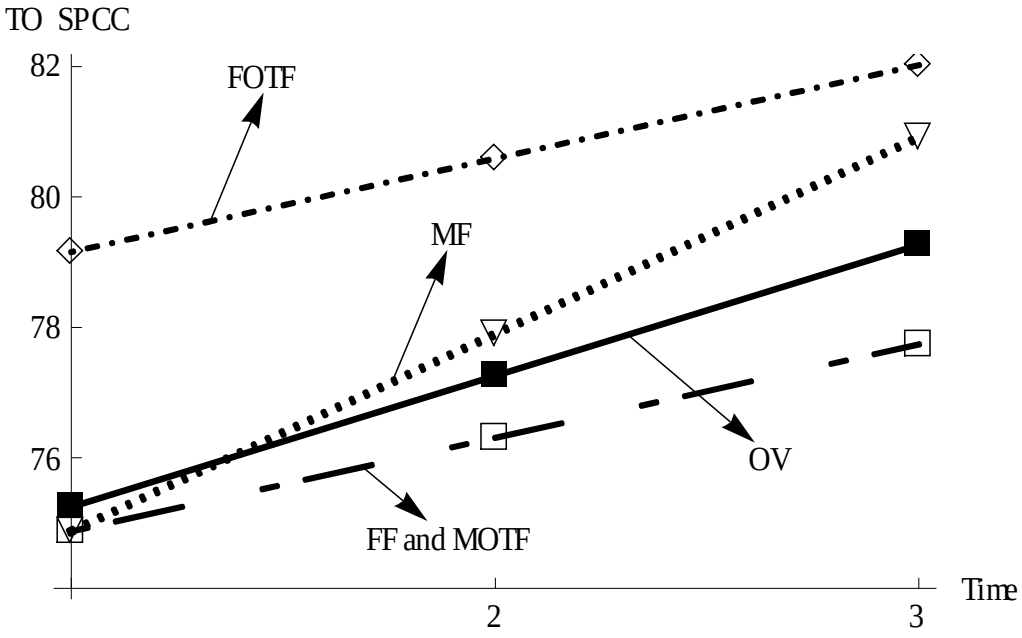

Figure 2: Estimated average growth trajectories for the overall (OV) sample, and for female-first-year (FF), female-other-than-first-year (FOTF), male-first-year (MF), and male-other-than-first-year (MOTF) subsamples across the three time points of data collection. TO = total SPCC score.

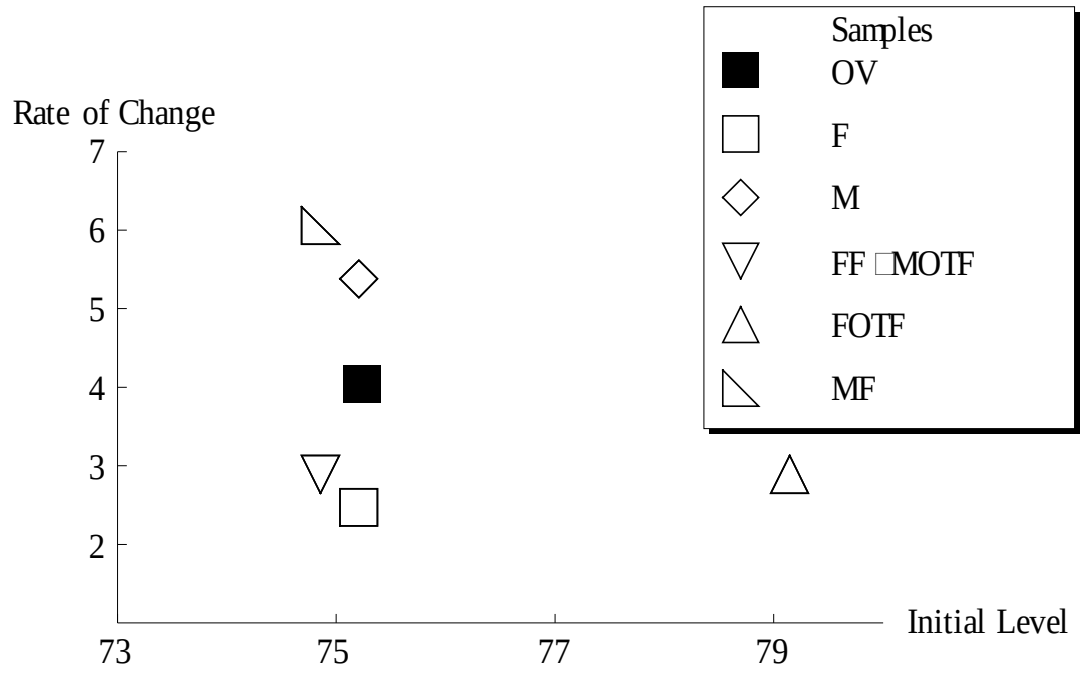

Figure 3: Estimated values of TO SPCC initial levels and rates of change for the overall (OV) sample, female (F), male (M), female-first-year (FF), female-other-than-first-year (FOTF), male-first-year (MF), and male-other-than-first-year (MOTF) subsamples.

An analysis of results in Table 3 provides an affirmative answer for RQ1 and indicates that the interaction between sex and class rank is associated with different patterns of change in students' TO SPCC scores. A comparison of average growth trajectories in Figure 2 reveals interesting differences among groups. Specifically, it indicates that FF and MOTF are the subgroups that are likely to require the most attention in a class aiming to enhance students' overall SPCC levels. More precisely, students in these two subgroups began the semester with the smallest TO SPCC scores from all four subgroups and had the smallest average increase over the duration of the semester. In contrast, FOTF students exhibited similar growth but started with significantly higher TO SPCC levels (standardized latent effect size for difference in average initial levels $\Delta = 0.32$). Another aspect pointing that students in the FF and MOTF might need additional attention is that students in the MF group (although starting at similar TO SPCC levels) exhibited significantly higher average rates of change than students in the other three groups (standardized latent effect size for difference in average rates of changes $\Delta = 0.37$).

Comparing the average trajectories of change for the four subgroups and the overall (i.e., OV) sample represented in Figure 2 provides important insights. First, the OV trajectory starts at a level that is comparable to those for FF, MF, and MOTF groups but is much lower than that for FOTF. Second, the OV slope is higher than those for FF, FOTF, and MOTF and lower than those for MF. Thus, the OV trajectory of change seems to represent properly none of the important subgroups of students considered in this analysis.

Discussion

This investigation revealed that although female and male students began the semester with similar TO SPCC levels their scores evolved differently during the semester in which they were enrolled in an introductory communication course. Specifically, females were characterized by homogeneous and small increases whereas males had a heterogeneous and steeper growth in TO SPCC. In addition, no significant linear relationship between initial levels and rates of change was detected for females but the two variables exhibited a negative association for males. These kinds of differences between female and male subsamples were not apparent in the context of previous studies that were limited by their choice of data collection design (i.e., employed only cross-sectional data; see, for example, MacIntyre, 1994; MacIntyre et al., 1999; Rosenfeld et al., 1995). The theoretical, methodological, and pedagogical implications of these disparities are addressed in details in the following paragraphs.

In addition, this investigation revealed no significant differences between first-year and other-than-first-year students in terms of time-related evolution in TO SPCC. However, when the interaction between sex and class rank was taken into account it appeared that different subgroups of participants exhibited different patterns of growth. Results from this research are partially in line

with the masculine-feminine framework (Shepherd, 1992) positing that female and male are characterized by different communicative behaviors. On one hand, on average, female and male participants began the semester at similar TO SPCC levels, but males had a steeper average increase over the course of the semester. In addition, when analyzing sex-based differences alone (i.e., without considering students' class rank) it was apparent that females had not only smaller but also more homogenous rates of change, whereas males exhibited significant variability around average levels of true growth. On the other, when class rank was included in the analysis, a more nuanced picture emerged. Specifically, males did not exhibit higher increases in TO SPCC than females across the board: only first-year male students had significantly higher rates of change than their female counterparts whereas other-than-first-year students had similar rates of increase regardless of whether they were male or female.

Methodological aspects and practical implications

Unlike traditional procedures (e.g., ANOVA, MANOVA) that are only able to inform about group-level changes and relegate interindividual differences to the error term (Voelkle, 2007), LGM models both aspects. This advantage is clearly illustrated by comparing results for FF and MOTF groups. An analysis focusing exclusively on average changes in these two groups would erroneously conclude that the groups exhibit identical patterns of change with respect to TO SPCC. Specifically, although mean trajectories of change for first-year female and other-than-first-year male students are identical, a consideration of aspects pertaining to individual differences in change reveals striking and informative differences between these two subgroups. In particular, MOTF respondents exhibited small and non-significant individual variability around their group's average rate of change (as indicated by the *p* value associated with the corresponding variance in true rate of change in Table 3) whereas for FF group this variability was much larger and statistically significant. This result has important pedagogical implications as it indicates that although student in both groups exhibited, on average, similar increases in TO SPCC during the given semester, the increase was homogeneous for MOTF but heterogeneous for FF. In turn, this finding brings about the conclusion that a more individualized approach is likely to be needed in instruction for FF students whereas for MOTF instructional strategies are likely to have homogeneous effects for most group members.

Findings of this work contribute significantly to pedagogical practice. Considering that results reported here are based on a large and representative sample of undergraduate students, they can be used as benchmarks of expected change for similar communication courses. Another important conclusion of this work is that students who initially perceived themselves as having lower levels of communication competence increased faster during the semester than their peers who were more confident in their communicational abilities. These results are consistent with previous findings unearthed in pre-post studies (Rubin et al., 1997) and illustrate, from a pedagogical perspective, that although class participation was beneficial for most students (overall there is an increasing trend in TO SPCC scores), on average the benefits are largest for the students who had least confidence in their communicative skills at the beginning of the course (Rubin et al., 1997). Although this finding holds for the overall sample caution is required when interpreting it. More precisely, when the analysis tackles these aspects at the subgroup level this conclusion may (e.g., for male and first-year students) or may not (e.g., for female and other-than-first-year students) remain true. This finding

underlines an important aspect that has been rarely addressed in extant communication research: valid inferences cannot be made without assessing the homogeneity/heterogeneity of the population of interest with respect to the characteristic(s) being investigated.

Findings from this research indicate that it is necessary to study patterns of communication at the subgroup rather than at the group level (where subgroups are defined as the interaction of salient dimensions; e.g., sex and class rank). Case in point, an analysis of Figure 2 reveals that the strength of the relationship between participation in the given course and outcome of interest (e.g., enhancement of students' TO SPCC levels) is heavily depending on the sample in which the targeted outcome was measured. More precisely, if one were to look at the effect that participating in the given course had on changes in females' TO SPCC scores, one would clearly reach different conclusions than when one would assess the same outcome for the overall sample or for the female other-than-first-year subgroup (see Figure 3). This finding brings about a pivotal conclusion: A valid and precise assessment of the effectiveness of an intervention (e.g., class instruction) cannot be achieved without an exact conceptualization of both outcomes of interest (e.g., increase in TO SPCC levels) and target population (e.g., female subsample). These types of analyses can, in addition, offer new information that can be used to identify additional factors that account for the observed differences among students (Ram & Grimm, 2007; Voelkle, 2007).

Limitations

This study unearthed important findings, but it is not itself without limitations. First, as only three waves of data were available, it was not possible to test hypotheses of non-linear change. Although all hypotheses of linear growth were strongly supported, if additional data points were available, a statistical test could be used to formally assess whether the addition of a non-linear component of growth affects significantly the fit of the model. Second, although it is known that having access to information obtained from several sources and collected with multiple methods enhances the quality of a study (Podsakoff & Organ, 1986), only data from self-reports could be obtained for this research. In particular, the inclusion of a qualitative component could have been beneficial in expanding knowledge about SPCC by allowing students the opportunity to engage more deeply with the construct and raise issues they considered pivotal (Yauch & Steudel, 2003). Future research could overcome these limitations and approach the study of change in SPCC from within a mixed method framework of inquiry that uses both qualitative and quantitative information to chart the construct's development across time. In addition, future studies could follow SPCC over a longer period of time (e.g., one year) and assess whether students' trajectories maintain their increasing trend after the end of the semester in which they participate in the given communication class.

Conclusion

The current study advances significantly extant communication research from theoretical, pedagogical, and methodological standpoints. Specifically, knowledge of SPCC's theoretical underpinnings is enhanced by explicitly modeling its evolution over a short period of time. This research also contributed significantly to pedagogical practice by creating the context for a more focused and efficient class instruction. More precisely, this investigation unearthed specific

information about differential ways in which readily identifiable subgroups of students benefited (i.e., increased their SPCC) from participating in an introductory communication class. Finally, from a methodological standpoint, this research illustrates practically how employing a powerful and versatile methodology such as LGM (Voelkle, 2007) provides answers to questions that could not be properly addressed with more traditional data analytical techniques such as multiple regression, repeated measures *t* tests and ANOVA.

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Appendix A

SPCC instrument

Directions: Below are twelve situations in which you might need to communicate. People's abilities to communicate effectively vary a lot, and sometimes the same person is more competent to communicate in one situation than in another. Please indicate how competent you believe you are to communicate in each of the situations described below. Indicate in the space provided at the left of each item your estimate of your competence. **Presume 0 = completely incompetent and 100 = completely competent. Your score can be anywhere between 0 and 100, or one of those numbers.**

____ 1. Present a talk to a group of strangers.

____ 2. Talk with an acquaintance.

____ 3. Talk in a large meeting of friends.

____ 4. Talk in a small group of strangers.

____ 5. Talk with a friend.

____ 6. Talk in a large meeting of acquaintances.

____ 7. Talk with a stranger.

____ 8. Present a talk to a group of friends.

____ 9. Talk in a small group of acquaintances.

____ 10. Talk in a large meeting of strangers.

____ 11. Talk in a small group of friends.

____ 12. Present a talk to a group of acquaintances.