6-2016

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The Effect of Posture on Classroom Participation

By

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Submitted in partial fulfillment

of the requirements for

Honors in the Department of Psychology

UNION COLLEGE

March, 2016

ABSTRACT

CERUTTI, JANINE   The effect of posture on classroom participation.
Department of Psychology, March 2016.

ADVISOR: George Bizer

Past research suggested that students with low self-esteem participate less in class

than students with high self-esteem. Separately, prior research investigated the effects of

nonverbal behavior on different variables such as confidence and performance. In the

current research, we explored the effect of posture on the level of class participation (i.e.

the number of times participants raised their hand to participate during a question-answer

session). First, participants were asked to take a self-esteem questionnaire before

participating in a simulated lecture. Next, participants were randomly assigned to either a

slumped or upright posture condition. During the lecture, participants watched a short

video followed by a question-answer session. Lastly, participants filled out a second self-

esteem questionnaire and then took a quiz. We hypothesized that participants in the

upright condition would show a greater increase in self-esteem, be more likely to answer

first, and participate more than those in the slumped condition. The results showed no

difference in participation levels between the two conditions; however, participants in the

upright condition showed a higher increase in self-esteem and were more likely to answer

first compared to participants in the slumped condition. Therefore, the research provides

insight into posture's effect on the classroom experience and, more specifically,

participation and self-esteem.

The Effect of Posture on Classroom Participation

Introduction

In the United States, the education system is intended to go beyond simple memorization and regurgitation of course material. Instead, students are highly encouraged to engage themselves by asking questions and contributing to class discussions. The classroom dynamic is multifaceted with numerous factors influencing the way individual students feel and perform in class. For instance, two students with equal academic abilities may have very different experiences in the classroom (Persaud & Salter, 2003). One important difference is the level of classroom participation, which varies from student to student and class to class. Heyman and Sailors (2011) defined class participation as a type of active learning in which students openly discuss relevant course material. In general, humans retain and understand information best when they are actively engaged. Thus, class participation enables students to actively enter the educational process. In addition to active engagement, classroom participation enhances learning in various ways.

Benefits of Classroom Participation

Prior research has suggested that students benefit from active forms of learning more so than passive ones (Petress, 2006). More specifically, class participation enhances teaching, brings vivacity to lessons, and adds more depth to the understanding of course material (Rocca, 2008). Smith (1997) explored the relationship between classroom participation and critical thinking (a valuable and difficult skill to master). He selected 12 faculty members at a liberal arts college who were chosen for their variety in teaching styles and disciplines. During the first 2 weeks of the fall semester, the researcher

attended each of the 12 classes to give an overview of the study, openly encourage

students to participate, and distribute packets of questionnaires assessing critical thinking

and attitudinal information. Over the course of the entire semester, the classes were tape-

recorded four different times and coded for student participation, peer-to-peer interaction,

faculty encouragement, and other classroom behaviors. During the last 2 weeks of the

term, the experimenter attended each class to again distribute questionnaires assessing

critical thinking. Results showed that student participation was positively associated with

critical thinking behaviors, such that students who participated more in class were more

likely to have higher critical thinking skills. Moreover, higher participation levels were

associated with less memorization. Thus, students who participated more in class spent

less time memorizing and more time interpreting and analyzing the information, which

was related to higher critical thinking skills (Smith, 1977). In general, the results showed

the important link between class participation and the learning process.

   Moreover, past research has shown that class participation can increase student

learning and motivation (Junn, 1994). For example, Junn (1994) implemented a study on

classroom participation, which rewarded elementary school aged students for

participating in class discussions. They were instructed to make at least 20 contributions

over the course of 30 classes. Every time students made a contribution in the class

discussion, they would write down their name, the date, and their comment on a slip of

paper and drop it into a box at the end of class in order to earn points. To promote quality

contributions, students were awarded bonus points for thoughtful contributions, which

were ones that demonstrated good critical thinking skills. After the 30th class, students

were surveyed and self-reported an overall positive experience from the exercise. Results

suggested that both the quantity and quality of student contributions improved and that

participation was more equally distributed among the entire class. Also, students reported

that the exercise enhanced their ability to participate in other courses, which suggested

that the benefits from the exercise generalized to classroom behaviors in other courses.

Therefore, promoting classroom participation through this simple exercise resulted in

various beneficial outcomes, such as getting students to think more critically and deeply

about class material in order to earn extra bonus points. Overall, classroom participation

is key to improving students' cognitive abilities (i.e. critical thinking skills), actively

engaging students in the learning process, and enhancing the overall classroom, or

educational, experience.

Differences in Class Participation

Classroom participation is an integral part of the education process; however,

quality and quantity of participation in the classroom differs greatly among students.

Differences in participation become especially critical in higher-level education, such as

graduate school, where participation is often evaluated as part of the overall course grade

(Petress, 2004). In one of the first studies evaluating differences in class participation and

the classroom dynamic, Hall and Sandler's (1982) suggested that male students

participate more in the college classroom more so than females primarily because faculty

members discriminate continuously against women in a variety of ways. However, the

study falls under scrutiny because the data collection (i.e. a literature survey of behavioral

sex differences) was arguably too anecdotal. More recent research suggested that,

although female students tend to participate less and are less assertive in class, teacher

discrimination is not the primary cause. Other factors such as class size, classroom

setting, and individual characteristics are more significant (Rocca, 2008).

Since Hall and Sandler's (1982) study, past research has continued to find gender

differences among students. For example, Brooks (1982) explored the relationship

between gender and student dominance in the classroom at a graduate level. The

researcher measured verbal participation and interaction among both male and female

graduate students. Results suggested that males demonstrated more aggressiveness (e.g.

interruptive behavior) and assertiveness (e.g. frequency or duration of speech) than

female students regardless of the professor's gender (Brooks, 1982). Thus, males can

often be more assertive and aggressive than their female counterparts in a classroom

setting.

Other research has assessed gender differences among undergraduates. For

example, Crawford and MacLeod (1990) surveyed 614 state university undergraduates to

explore perceptions of student-teacher interactions. Results suggested that males

participated more than females in large class settings. In a second study, they surveyed

761 small liberal arts undergraduates in order to explore the reasons that students do not

participate in the classroom. Results showed that female students attributed their

nonparticipation to poorly formulated ideas, ignorance about class material, and fear of

appearing unintelligent in class. On the other hand, male students reported their silence

was due to feeling under-prepared or fear of harming their course grade. Depending on

class size, males in general participated more than females, and female students attributed

their silence to feeling less confident of their intellectual abilities while males did not.

Overall, females' lack of participation was highly related to their confidence while males'

lack of participation was related to being underprepared for class (Crawford & MacLeod, 1990).

In addition to sex differences in classroom participation, Williams (1971) investigated the relationship between class participation and individual student characteristics, such as self-esteem. Participants were given various questionnaires assessing personality, ability, and achievement variables. In general, results showed that nonparticipating students demonstrated the greatest level of insecurity and the lowest level of self-esteem (Williams, 1971). Similarly, Morrison and Thomas (1975) explored the relationship between self-esteem and classroom participation. They hypothesized that college students with low self-esteem would speak less in class, contribute in smaller proportions to class discussions, and sit towards the back of the classroom. During an introductory psychology class, 78 college undergraduates completed two surveys assessing different types of self-esteem and filled out information cards to identify which seat number they were currently sitting in at the beginning of the term. Four random times during the term, the instructor passed out forms at the end of class requesting the following: seat number, number of contributions to discussion during today's class, and number of times the student wanted to participate or share but did not. Results confirmed their hypotheses when students were evaluated specifically on the basis of school self-esteem, such that students with lower school self-esteem participated less frequently, in smaller amounts, and sat towards the back of the room during class compared to students with higher school self-esteem (Morrison and Thomas, 1975).

Similarly, Gaylon, Blondin, Nalls, & Williams (2012) explored the relationship between academic self-efficacy (i.e. an individual's belief in his or her abilities to perform

a particular academic task or behavior) and class participation as well as exam scores. The study included 167 undergraduate students enrolled in three Educational Psychology courses of equal size. Gaylon et al. (2012) measured academic self-efficacy with a questionnaire composed of items that individually measured a different task area related specifically to the course (e.g. concentration in class, memorization, understanding of class concepts, and note-taking). Also, observers collected classroom participation data by recording the number of voluntary comments made by each student on a given day in class. Results showed that self-efficacy was significantly related to exam scores and participation in class discussions. More specifically, students with high self-efficacy were more likely to participate more in class than students with low or moderate self-efficacy. Therefore, enhancing self-efficacy to its highest level may positively impact a student's academic experience (Gaylon et al., 2012). Overall, various types of self-esteem are an important factor in the level of classroom participation among students. Noticeably, how students feel about themselves in the classroom mirrors how they act or perform in the same setting. In regards to the positive relationship between self-esteem and class participation, students lacking self-esteem, especially females, may be at a greater disadvantage in the classroom.

Enhancing Classroom Participation

Recent evidence proposed that females participate in class on average less than males due to factors such as confidence (Rocca, 2008). Additionally, Morrison and Thomas (1975) found that students with low school self-esteem participated less in class regardless of gender, and Gaylon et al. (2012) showed that higher academic self-efficacy was related with increased classroom participation. Differences in class participation

become even more critical when considering the various benefits students who do participate gain such as an enhanced understanding of the material and critical thinking skills (Smith, 1997). With an increasing emphasis placed on classroom participation, how can students enhance the quality and quantity of participation?

Since class participation benefits students across various domains, past research has focused on how to enhance classroom participation. For example, Boniecki and Moore (2003) used a token economy to reinforce classroom participation. In a large introductory psychology class, students earned tokens for participation and then were able to exchange the tokens for extra credit. Boniecki and Moore (2003) recorded the level of participation in class before, during, and after the intervention. Results showed that the amount of participation increased when the token economy was in place. When the token economy was removed, participation returned to the same level as before the intervention was implemented. Also, students responded more quickly to the instructor's questions during the token economy than before or after it (Boniecki et al., 2003). Overall, this research suggests that motivating students with incentives (e.g. extra credit) is an effective way to increase class participation.

In addition to motivating students externally, one study utilized self-modeling as an intervention to improve participation in the classroom (Hartley, Bray, & Kehle, 1998). Hartley et al. (1998) defined the self-modeling technique as positive changes in behavior due to viewing oneself doing the behavior. Hartley et al. (1998) showed students edited videotapes of themselves successfully volunteering to participate by raising their hands in class. Results showed that student participation levels increased during and after the intervention in comparison to baseline participation levels before the intervention. Thus,

self-modeling was an effective strategy to increase participatory behavior in the

classroom.

Effects of Nonverbal Behavior

Besides motivating students both internally and externally to participate more in

class, tweaking body language, or modifying one's nonverbal behavior, may be a key

factor to boost confidence and, subsequently, improve class participation. Researchers

have explored the effects of nonverbal behavior on a number of different factors,

including performance and perception. The subtlest body language can greatly impact

relationships, social interactions, one's own perception of the environment, and the

perception of others. More specifically, prior research has suggested that dominant

nonverbal behaviors (e.g. having an expansive posture) influence confidence, stress

levels, performance, and more (Cuddy, Wilmuth, Yap, & Carney, 2015). For example,

Briñol, Petty, & Wagner (2009) investigated the effects of posture on self-evaluations. In

the experiment, college students were asked to think about and write down their best or

worst qualities while they were either sitting in a confident posture (i.e. back erect with

chest pushing out) or a doubtful posture (i.e. slouched forward with back curved). Then,

they rated themselves on how well they would do as a future professional employee.

Results showed that if they wrote positive traits about themselves, they later rated

themselves more highly on future job performances and vice versa. Notably, when

students wrote positive thoughts about themselves, they rated themselves more highly in

the confident than the doubtful posture. These findings suggested that the confident

posture led to confidence in the positive thoughts while the doubtful posture did not seem

to convince students to believe in their own thoughts. In other words, the different

postures did not impact the number or quality of positive/negative thoughts, but it did influence the confidence with which people believed in their thoughts. Overall, body posture can impact not only what others think about each other, but also how individuals think about themselves. Therefore, body posture, or nonverbal behavior, appears to influence an individual's confidence (Briñol et al., 2009).

Similarly, Cuddy et al. (2015) investigated the effects of nonverbal behavior on individuals. More specially, they explored the effects of preparatory power posing (i.e. posing in a dominant stance such as the "super woman" pose) on job interview performance. They hypothesized that power posing before a stressful mock job interview would boost performance during the interview due to an observable increase in nonverbal presence. Participants were randomly assigned to a high power pose condition (i.e. expansive, open) or a low power pose condition (i.e. contractive, closed). Participants were instructed to hold the pose for two minutes in private, and then were asked to deliver a speech to two evaluators as part of a mock interview. All speeches were videotaped and coded for overall performance, which included hireability, verbal content (e.g. structure, content), and nonverbal presence (e.g. captivating, enthusiastic). Results showed that the high power pose participants were rated higher in hireability. Additionally, in contrast to the low-power posers, adopting a high-power pose boosted feelings of power, confidence, self-esteem, risk tolerance, mood, action orientation, pain tolerance, testosterone, and reduced feelings of fear and levels of cortisol (i.e. stress) (Cuddy et al., 2015). Cuddy et al.'s (2015) study on power posing explored the effect of presence, a nonverbal factor that has received little attention in the field of psychology yet influences many diverse social interactions. Future research should explore whether

the beneficial effects of preparatory power posing persist in extended and more

naturalistic settings (Cuddy et al., 2015).

In addition to the effects of standing postures on individuals, other past research

has found similar effects of seated postures. For example, Nair, Sagar, Sollers,

Consedine, and Broadbent (2014) investigated the effect of seated posture on stress and

emotional responses. Participants were randomly assigned to either a slumped or upright

seated posture and asked to hold this posture throughout the entirety of the study. Next,

participants were asked to complete a stressful task as well as mood, self-esteem, and

perceived threat assessments. Results showed that participants in the upright seated

condition reported higher self-esteem, better mood, enhanced arousal, and less fear than

participants in the slumped seated condition (Nair et al., 2014). Therefore, Nair et al.

(2014) concluded that adopting an upright seated posture during a stressful event can help

individuals maintain their self-esteem and reduce negative affect compared to adopting a

slumped seated posture. Overall, sitting in an upright position can help individuals be

more resilient to stress and have higher self-esteem.

The concept of manipulating posture to boost self-esteem is highly applicable to

an academic setting; however, having ample time to, for example, power pose before

class presents a challenge and the potential benefits may not exceed the entire class

period. However, the posture an individual adopts while sitting can have similar effects

as power posing such as boosting self-esteem and enhancing positive mood (Nair et al.,

2016). Similarly to Nair et al.'s (2016) findings that upright-seated postures positively

influence self-esteem and Morrison and Thomas's (1975) findings that individuals with

higher self-esteem participate more in class, we hypothesized that participants in the

upright condition would show higher self-esteem as well as a greater increase in self-esteem, would participate more, would be more likely to answer first during the question-answer session, and would rate themselves better on participation than those in the slumped condition.

Method

Participants

The study included 60 participants: 16 males and 44 females. All participants were Union College students and ranged in age from 18-22 years. However, 2 participants (3.33%) who guessed the dependent variable (participation level) and 4 participants (6.67%) who did not hold the posture correctly were excluded from the study. Participants were free to sign up online to take part in the study and were either monetarily compensated or received course credit for the study.

Procedure

Before participants entered Union College's research laboratory, an iPhone 4, which was hidden from plain sight in the front of the lab room, was turned on and used to video record the participants during the entirety of the study. Upon entering Union College's research laboratory, participants were first asked to take a seat in one of four cubicle rooms inside the lab room, and to complete and sign an informed consent form. Participants were told that the aim of this study was to learn about the classroom dynamic. After completing the informed consent form, participants were asked to complete Heatherton and Polivy's (1991) State Self-Esteem Scale (SSES) for a baseline measure. The SSES is a 20-item questionnaire to assess performance, social, and appearance self-esteem, and ranges from 1 (*not at all*) to 5 (*extremely*). Three example

statements on the SSES are "I feel confident about my abilities," "I am worried about what other people think of me," and "I am pleased with my appearance right now."

Next, participants were randomly assigned to one of two conditions (slumped posture or upright posture) by the researcher randomly distributing printed instructions to each cubicle, which included the assigned conditions and an assigned seat. Similarly to Nair et al. (2014), participants in the slumped condition were asked to sit in the chair in a slumped posture with rounded shoulders and a stooped back similarly to the picture below [*see Figure A*]. In the upright condition, participants were asked to sit in the chair in an upright posture with an erect back and straight shoulders similarly to the picture below [*see Figure B]*. Additionally, the directions explained that they would be participating in a simulated classroom lecture, in which they would be asked to raise their hand and wait to be called on by the teacher in order to participate in the question-answer part of the lecture. Furthermore, the printed directions asked that participants practice the posture now and to try to remain in the position for the entirety of the simulated lecture. At the end of the directions, participants were asked to please not share their assignment with anyone.

Next, the experimenter asked the participants if they had any questions or concerns and, then, asked them to find their assigned seat at the table in the main room. Index cards taped to the back of each seat were labeled A, B, or C. A confederate, who was a researcher disguised as a participant, was previously assigned to sit in seat B. The confederate, who was both hypothesis- and condition-blind, sat in a neutral posture in between the participants in order to make the contrasting posture conditions less obvious. Also, the confederate was previously instructed to always answer the second of four

questions without hesitation and, if no participants were immediately participating, to count to "5 Mississippi" before answering the other questions during the question-answer session. Next, the teacher (an experimenter who was both hypothesis and condition-blind) explained that the class would be participating in three tasks: viewing a short video lecture, participating in a question-answer session, and taking a quiz based on the video. The teacher asked that if anyone wishes to participate during the question-answer section, to please raise their hand and wait to be called on. Lastly, the teacher explained that the tasks were chosen in order to create a more realistic classroom environment and reminded participants that they would be returning to their cubicles to take the quiz after the video and question-answer session.

Once directions were given and made clear, the teacher played a TED Talk video, which was projected onto a projector screen at the front of the room. Similarly to Zeamer and Fox Tree (2013), a 5:49 minute lecture titled "Graham Hill: Less stuff, more happiness" (2011) from the TED online lecture archive was selected as the simulated classroom material.

Immediately after the lecture, the teacher asked the participants if there were any questions before beginning the question-answer session. Then, the teacher asked a series of 4 questions and immediately called on a participant (or confederate) as soon as he or she raised his or her hand. If more than one participant (or confederate) raised his or her hand, the teacher called on each person in the order in which the hands were raised. Based off the TED talk, the four open-ended questions included:

1. Do you think you have too much stuff? Why or why not?

2. What is one way you can create a smaller footprint?

3. Do you believe people can buy their happiness? Why or why not?

4. What are some benefits of living an "edited life"?

After everyone had a chance to participate and before asking the succeeding question, the teacher's only verbal feedback was "Good, good. Next question." When all questions were answered, the teacher asked participants to return to the same cubicle for the quiz. Before the quiz, the experimenter distributed another copy of the SSES and told each participant that he or she no longer had to hold the posture. Then, the experimenter distributed the quiz, which included six "true or false" questions based off the TED talk video. An example quiz question was "The United States has 2.2 million square feet of self-storage. True or False?" The participants were also told that they could meet the experimenter in the main room for debriefing after completing the quiz.

Finally, participants were debriefed in the main room and informed that they had been videotape recorded to ensure that all participants held the posture correctly for the entirety of the study. Participants were given the option to either (a) agree to release the videotape for the purpose of the study or (b) disagree to release the videotape and have it deleted. If participants disagreed, then they would watch as the experimenter immediately deleted the video off the iPhone, but would still receive monetary compensation or course credit for the study. However, every participant agreed to release the recording. When participants agreed, they signed an additional consent form granting permission to utilize the recording for the study. When the debriefing session was over, participants were paid or given course credit and released. Both self-esteem questionnaires were stapled to each participant's direction sheet, which had the corresponding seat number in order to keep track of conditions for data purposes. The video footage was used to count how many

times each participant raised his or her hand during the question-answer session and to

ensure that participants held the posture sufficiently.

Figures A and B
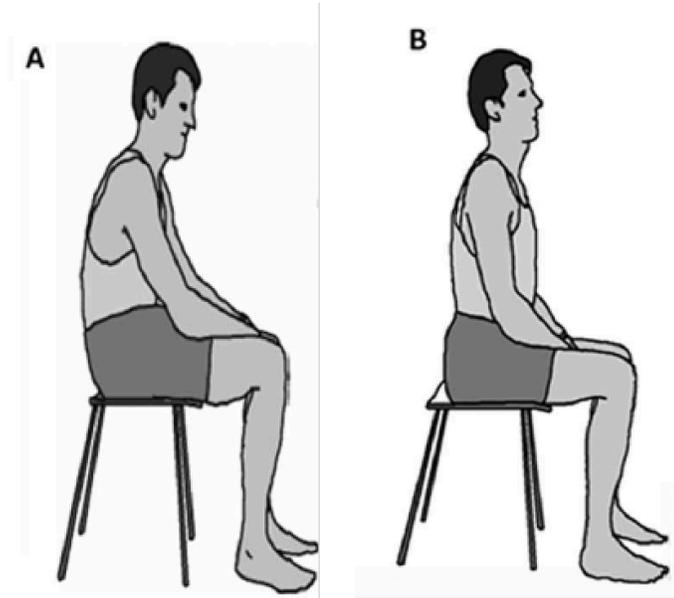
Results

  The alpha coefficient for the first 20-item self-esteem questionnaire (SSES1),

which was administered at the beginning of the experiment, was 0.92. Additionally, the

alpha coefficient for the second 20-item self-esteem questionnaire (SSES2), which was

identical to SSES1 but administered at the end of the experiment, was 0.92. Thus, both

self-esteem measures had high reliability. In other words, the questionnaires were a

reliable measure of self-esteem.

  We first assessed the extent to which the posture manipulation influenced the

level of participation. Contrary to our predictions, the manipulation did not impact the

level of participation (t (52)=-0.00, p=1.00), such that participants in the upright

condition (M=1.74 responses volunteered) and participants in the slumped condition

(M=1.74 responses volunteered) had equivalent levels of participation. Thus, the posture manipulation did not impact how many times each participant participated.

Next, we assessed the extent to which the posture manipulation impacted self-esteem. Contrary to our predictions, there was no effect of the manipulation on the second self-esteem questionnaire (t (52)=0.80, p=.43), such that the upright condition (M=75.37) and the slumped condition (M=72.78) scored equivalently on SSES2. However, we assessed the extent to which the manipulation yielded a change in self-esteem (i.e. the difference between scores on SSES1 and SSES2). For each change in self-esteem score, a positive number indicates an increase in self-esteem while a negative number indicates a decrease in self-esteem. As predicted, participants in the upright condition showed a higher increase in self-esteem than participants in the slumped condition (t (52)=1.97, p=.05), such that the upright condition displayed a greater increase in self-esteem (M=2.93) than did the slumped condition (M=-1.37). Thus, participants experienced a greater increase in self-esteem after adopting the upright posture compared to participants in the slumped condition.

Next, we assessed the extent to which the manipulation affected self-ratings of participation. Contrary to our predictions, there was no effect of the manipulation on participation self-rating (t (51)=0.10, p=.92), such that participants in the upright condition (M=3.77) and participants in the slumped condition (M=3.74) rated themselves equivalently on class participation. Thus, the posture manipulation did not impact how well participants thought they performed during the question-answer session.

Next, we evaluated the extent to which the manipulation influenced whether participants were the first to volunteer an answer during the question-answer session. As

predicted, participants in the upright condition were more likely to answer first in the

question-answer session, X^2 (1)=4.80, p=.03. Among participants in the upright

condition, 19 of 27 (70%) answered the first question first. Among participants in the

slumped condition, 11 of 27 (41%) answered the first question first. Thus, participants in

the upright condition were more likely to participate first compared to those in the

slumped condition. Additionally, we evaluated the association between answering first

and overall participation. As expected, there was a significant relationship between

answering first and overall participation, (t (58)=-5.42, p<.001). Thus, participants who

answered first participated (*M*=2.16 responses volunteered) more so than participants

who did not answer first (*M*=1.21 responses volunteered). Therefore, the posture

manipulation perhaps influenced answering first, and answering first may have, in turn,

impacted participation levels.

      Next, we assessed the extent to which the posture manipulation and initial self-

esteem (SSES1) may have interacted in order to predict our various outcomes variables.

To do so, we calculated an interaction term by multiplying the posture condition variable

by the continuous measure of self-esteem. Then, we used initial self-esteem, the variable

representing the posture manipulation, and the interaction term to predict the outcome

variables.

      We first submitted participation to a regression analysis with these three variables

as predictors. Neither posture condition (*b*= -0.17, *p*=.84), initial self-esteem (*b*=-0.10,

p=.82), nor the interaction term (*b*=0.20, *p*=.84) were significant predictors of

participation. Secondly, we submitted the second self-esteem rating (SSES2) to a

regression analysis with these three variables as predictors. Neither posture condition

(b=-0.56, p=.25) nor the interaction term (b=0.47, p=.40) were significant predictors of

SSES2. However, initial self-esteem was a significant predictor of SSES2 (b=0.59,

p=.03), which shows that the two self-esteem measures were correlated. Thirdly, we

submitted whether participants were the first-to-answer during the question-answer

session to a regression analysis with these three variables as predictors. Neither posture

condition (b=-0.11, p=.89), initial self-esteem (b=0.15, p=.73), nor the interaction term

(b=-0.23, p=.80) were significant predictors of whether participants were first-to-answer

or not. Lastly, we submitted participation self-ratings to a regression analysis with these

three variables as predictors. Neither posture condition (b=0.29, p=.73), initial self-

esteem (b=0.30, p=.51), nor the interaction term (b=-0.35, p=.71) were significant

predictors of participation self-ratings.

These four analyses demonstrate that the posture manipulation and initial self-

esteem reports did not interact to predict our outcome variables. Thus, participants' initial

level of self-esteem did not moderate our findings (the upright condition answered first

more often and showed a greater increase in self-esteem than did the slumped condition).

In other words, the extent to which the manipulation affected being first to answer and

self-esteem increases was just as strong for high self-esteem people as it was for low self-

esteem people. Therefore, these results speak to the generalizability of posture's effect on

class participation and self-esteem.

Discussion

Nonverbal behavior, specifically seated posture, may influence stress levels,

emotional responses, and self-esteem (Nair et al., 2014), but may also affect performance,

such as class participation, in an academic setting. The current research investigated

whether posture could impact self-esteem and the level of participation during a

simulated classroom lecture.

In the current research, we examined whether posture could influence

participation levels by assigning participants to one of two conditions (upright vs.

slumped) and asking them to participate in a simulated lecture, which included a video,

question-answer session, and quiz. First, we hypothesized that participants in the upright

condition would participate more and be more likely to answer first than participants in

the slumped condition. Secondly, we hypothesized that the upright condition would show

a greater increase in self-esteem and an overall higher level of self-esteem than the

slumped condition. Lastly, we hypothesized that participants in the upright condition

would demonstrate higher self-ratings of participation than those in the slumped

condition. The hypothesis was only partially supported. Results indicated that participants

in the upright condition were more likely to participate first in the question-answer

session compared to the slumped condition, but, surprisingly, overall level of

participation did not differ between groups. Interestingly, results showed that participants

who answered first participated more during the question-answer session than

participants who did not answer first. Furthermore, the two conditions did not differ

significantly on participation self-ratings and self-esteem; however, the upright condition

showed a greater increase in self-esteem than did the slumped condition.

Implications

Our research suggests that one's posture in class may affect self-esteem and,

subsequently, classroom performance. Although posture did not affect overall level of

participation, participants in the upright condition were more likely to be the first-to-

answer at the start of the question-answer session. Moreover, participants who were the

first to answer participated more during the question-answer session than participants

who were not the first to speak up. These findings suggest that being first-to-answer may

have mediated the impact of the manipulation on participation. In other words, one may

be more likely to participate first if his or her posture is upright and erect. And if one

participates first, then he or she is more likely to participate more. Overall, participating

more can hone verbal communication skills, critical thinking skills, and provide a deeper

understanding of the relevant class material (Smith, 1977).

Additionally, the current research supports prior findings that posture influences

self-esteem. Prior research demonstrated that having erect, upright posture (standing or

sitting) boosts self-esteem and reduces feelings of fear (Cuddy et al., 2015; Nair et al.,

2014). Since a student can easily manipulate and monitor his or her seated posture in the

classroom, adopting an upright posture can subsequently enhance self-esteem and,

perhaps, diminish feelings of fear to speak up in class. Separately, past research

suggested various advantages to participating in class such as improved cognitive

abilities (e.g. critical thinking skills), active engagement in the learning process, and

enhancement of the classroom experience (Smith, 1977; Junn, 1994). In conclusion,

adopting an upright posture in class can help students to feel more confident in the

classroom, which can lead to higher levels of participation and, subsequently, to gaining a

more integrative, rewarding academic experience.

Limitations

Perhaps the most notable limitation of our research is that the experiment took

place in a laboratory room and not in a real classroom setting. Although the current study

tried to create a realistic classroom environment, space and resources were limited. The

"classroom" involved a total of 3 students (sometimes only 2 students) and 1 teacher,

which is much smaller than a regular class size. Also, although the "classroom" was set

up with a big table and 3 chairs facing the projector screen at the front of the room, the

room still looked like a lab room. This, in turn, may have made participants feel awkward

or uncomfortable during the simulated lecture, especially when asked to raise their hands

to answer questions. Thus, the extent to which the results of the current study can be

generalized to a real classroom setting is small. Moreover, one reason why we did not

find a significant relationship between posture and participation levels may partly be due

to the lack of a realistic classroom setting. Perhaps, replicating the study with more

participants and/or in a real classroom may make the study more generalizable and

provide support for the hypothesis that posture impacts levels of participation.

Additionally, another limitation of our study was the structure of the question-

answer session. Firstly, the teacher only asked participants 4 questions in total, which

may not have given participants ample opportunity to participate. If the question-answer

session included more than 4 questions, this would have allowed individual participation

levels to have a greater range, which could lead to more variance in the results. Secondly,

the structure of the question-answer session was unrealistic to a real classroom setting. In

a real classroom, the teacher often prompts an open-forum, or open-discussion, where

students are free to not only answer, but also ask questions. The structure of the question-

answer session in the current study may have decreased individual participation.

However, including more questions in the question-answer session or creating a more

open-forum could alleviate this problem and, in turn, provide support for our hypothesis that posture impacts level of participation.

A third limitation of our study was that all participants were Union College students. The lack of diversity among participants may have influenced our results because Union is a small liberal arts school. Therefore, our results are only representative of a select part of the U.S. student population. Perhaps, students at a small liberal arts college are more accustomed to participating in small class settings, which may be one reason why the posture manipulation did not impact participation levels. Thus, the results may have been different if the study was also conducted at a big state school, or among nonstudents, because those participants may be less comfortable speaking up in small class settings. Also, since Union has a small student body of around 2,400, students are more likely to recognize, or even know, other students in any setting on campus. Thus, participants may have been more or less comfortable depending on their relations to the researchers or other participants during the study. This could have influenced their participation and self-esteem levels. Replicating the study at bigger colleges and universities would perhaps alleviate this issue. By collecting and analyzing data from a more diverse population, we would be able to generalize our results more confidently to a broader student body.

Directions for Future Research

One interesting avenue for future research would be to investigate the effect of posture on student performance over an extended period of time. For example, one could manipulate and monitor students' postures over the course of an entire semester and evaluate the extent to which posture impacted self-esteem, participation, teacher ratings,

grades, and more. It would be especially interesting to examine whether upright posture

leads to higher grades.

Moreover, another interesting possibility for future research would be to examine

the effects of posture among students with low and high anxiety. Since upright seated

postures have been shown in prior research to reduce feelings of fear or anxiety (Nair et

al., 2016), it would be interesting to investigate whether manipulating posture would have

a bigger impact on students suffering from anxiety, especially test anxiety. Perhaps,

adopting an erect posture to reduce fear and anxiety in the classroom would serve as an

effective strategy to enhance one's overall classroom and educational experience.

Future research should investigate the effect of posture in the classroom on

different types of self-esteem. For example, Gaylon et al. (2012) assessed the relationship

between academic self-efficacy (i.e. an individual's belief in his or her abilities to

perform a particular academic task or behavior) and class participation. They found that

students with high self-efficacy participated more in class than students with lower self-

efficacy. Thus, it would be interesting to see whether posture has a greater, equal, or

lesser effect on various types of self-esteem, such as academic self-efficacy, school self-

esteem, or social self-esteem.

In conclusion, manipulating one's posture may be a simple, nonverbal "life-hack"

to boost self-esteem, participation, and overall classroom performance. If students feel

more confident in the classroom and, subsequently, participate more, then they create

more opportunities to hone important skills such as critical thinking and may generate a

more dynamic, positive educational experience. Future research should further

investigate the impact of seated posture and other nonverbal behaviors, such as hand-

raising, on the classroom experience.

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