Comparing students' evaluations and recall for Student Pecha Kucha and PowerPoint Presentations

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Abstract: Two experiments compared student reaction to and memory of peer presentations using either a fast-paced, images only format (Pecha Kucha) or a traditional PowerPoint presentation. In experiment 1, students saw a prerecorded 5-minute PowerPoint, 10-minute PowerPoint, or 5-minute Pecha Kucha presentation. Students rated the presentation and wrote down main points. One week later students completed an on-line survey. There were no recall differences, but a visual purpose rating was higher for Pecha Kucha. In experiment 2, students watched two presentations (10-minute PowerPoint and 5-minute Pecha Kucha) in a counterbalanced within-subjects design (same procedures used). Although students rated the Pecha Kucha presentation more positively, there were no recall differences. Results suggest Pecha Kucha is a useful student presentation style that maintains similar levels of retention.

I. Introduction.

Student presentations are incorporated into many psychology courses for a variety of reasons, which include increasing students' oral communication skills, actively engaging students in the material, and encouraging students to learn from one another. Students' competency in communication skills is a common goal for many universities and in line with goal seven of APA's guidelines for psychology majors (Halonen, Appleby, Brewer, Buskist, Gillem, Halpern et al., 2002). Student presentations enable students to learn from their peers and provide the opportunity for practice organizing material for public dissemination. Many students choose to use PowerPoint for their presentations, but then read straight from the slides or put too much information on each slide. The focus of the present study is to examine student interest and retention of presented material using Pecha Kucha (pronounced pa-chok-cha), a new presentation style designed to minimize some of the pitfalls of traditional PowerPoint presentations.

In a Pecha Kucha presentation, the user creates 20-second automated, pictorial slides within a program such as PowerPoint (or Prezi or SlideRocket). Developed in 2003, Pecha Kucha is a visual presentation style where each automated slide contains only pictures, photos, or graphics (i.e., pictorial, limited or no text; Glendall, 2007; http://www.pecha-kucha.org). The timing and style of Pecha Kucha may improve student presentations. The automatization and fast pace of the slides forces the presenter to be organized in order to capture each slide's message. The selection of imagery used can support key points (Eves & Davis, 2008) and the presenter's verbal message is not competing with slide text. Previous research has identified ineffective PowerPoint presentation issues, such as the presenter's message not mapping onto the slide text, the presenter reading from slide, or issues with font text size on the slides (Eves & Davis, 2008; Paradi, 2003). The Pecha Kucha presentation style is designed to minimize or eliminate many of these problems.

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Few studies have examined Pecha Kucha as a PowerPoint presentation style. Beyer (2011) rated student class presentations that were either Pecha Kucha or traditional text-based PowerPoint (text and images on slides) and also had students rate their peers' presentations. The research was a series of studies including student choice and random assignment of presentation style, as well as using a between and within-subjects design. Beyer found that Pecha Kucha presentations had higher instructor ratings of eye contact, visuals, and overall presentation quality compared to student PowerPoint presentations. Although Beyer (2011) demonstrated that Pecha Kucha improves aspects of student presentation quality as compared to traditional PowerPoint, the study design had limited experimental control. For example, there was variability in the quality of the presentations given (students were only given general content and style restrictions). Additionally, the study did not include measures of retention of the material presented, so its effectiveness for student learning was not assessed. The current study design addresses these issues by using standardized presentations selected as good examples of each style and includes a measure of student retention of the material.

Pecha Kucha may also be superior to traditional PowerPoint presentations in terms of learning. One issue of multimedia learning is concern for cognitive load (Sweller, 1994). Depending on how the information is presented, processing capacity can be diminished. For example, Mayer, Moreno, Boire, and Vagge (1999) found that individuals who were presented large clips of alternating auditory and visual information performed worse than those who had concurrent clips or small alternating auditory and visual clips. Pecha Kucha may be a presentation that reduces cognitive load. There is no redundancy (or contradiction) of text on the slide with the auditory presentation. There is also an alignment of the chosen image and the message being presented with the timing of the images synchronized to the auditory message. Each of these differences ties into Mayer and Moreno's (2003) suggestions for reducing cognitive load in multimedia learning.

Previous research has examined the impact of PowerPoint presentations on student retention for lecture material. While findings have been mixed, in part due to methodological differences and limitations, two studies with stronger internal validity, have found evidence of better retention of lecture material presented with no slides or concise slides. Savoy, Proctor, and Salvendy (2009) compared students who attended PowerPoint lectures, traditional lectures, and/or those that did not go to class. Students attending the traditional lecture retained more of the auditory information compared to the PowerPoint lecture and those that did not attend class. For graphic material and material that was presented both orally and visually, those that attended either class did better than those that did not attend class. Interestingly, even though information was not better remembered with PowerPoint, the students preferred PowerPoint and felt like the PowerPoint presentation made the important material easier to identify. This suggests that student preference and perception of PowerPoint may not equate to better learning (Savoy et al., 2009). Wecker (2012) found similar findings using a between-subjects design with three conditions (no slides, 10 slides, or 4 slides) for a 30-minute presentation. The concise and no slides conditions had better retention of oral information compared to regular slides. Both studies suggest that traditional, text-based PowerPoint slides may not enhance learning, perhaps due to issues of cognitive load.

A recent meta-analysis of 57 studies examined student learning (recall, transfer, or response times) comparing spoken-only lectures and spoken-written lectures (Adesope & Nesbit, 2012). Studies included in the meta-analysis used random assignment or pretest/posttest data. Spoken-written lectures included those presentations where the written material was fully or

partially redundant with spoken material, and whether or not images or animation were included was noted. Although they did not focus on comparing auditory information to visual information, they found a small advantage of spoken-written lectures over the spoken only (particularly for those that were partially redundant; Adesope & Nesbit, 2012). Overall, their findings support verbal redundancy to be a positive factor in student learning (with the spoken message being in unison with the written one), but perhaps with the reduction of cognitive load (the less images/animations, the better material was retained).

There is limited research examining the use and learning impact of Pecha Kucha in the classroom. Klentzin, Paladino, Johnson, and Devine (2009) found that Pecha Kucha is as effective as traditional PowerPoint presentations for student retention of lecture information. Students listened to either a Pecha Kucha lecture (20 slides for 20 seconds each) or a traditional PowerPoint lecture (42 slides with no set timing) from a librarian instructor. Students then completed a 10-item true/false test on the material presented. There were no differences between the two groups' performance (both had averages of 91%). There were no student ratings of the presentation in the Klentzin et al study. Klentzin and colleagues' findings suggest that Pecha Kucha can more succinctly present information at the same quality level as a longer PowerPoint format with no immediate differences in student learning of the material. There has been little empirical work examining retention of peer presentations and no research comparing retention across different types of student presentations. We were specifically interested in comparing student interest and retention from peer PowerPoint and Pecha Kucha presentations. Pecha Kucha may be more appropriate for a student versus lecture presentation as the automated pace limits faculty-student interaction. As a student presentation style, it forces students to be more familiar with their material and reduces the mistakes often seen with traditional power-point slides. The pacing of Pecha Kucha allows student presentations to keep on time, and the pace of the slides may keep peers' attention while listening to numerous student presentations.

The goal of our study was to examine possible benefits of using Pecha Kucha for student presentations rather than traditional PowerPoint. How do students react to presentations that rely more on visual cues than text? How well do students retain information from a student presentation when presented in different formats? We were interested in examining possible differences of student ratings of student presentation quality and retention scores for the two presentation styles. The current study uses pre-recorded presentations from the same student presenter to minimize variability noted in previous research. Based on previous research, it is expected that students will have higher ratings of presentation quality for the Pecha Kucha, but there will be no differences in retention of the information presented despite a shorter presentation time.

We developed a set of studies to compare student presentation quality ratings and memory for recorded student presentations in one of three formats: a 5-minute or a 10-minute traditional PowerPoint, or a 5-minute Pecha Kucha. A 10-minute PowerPoint condition was added to determine whether there were differences in retention of the information when it was elaborated on verbally, without additional visuals. One undergraduate student research assistant was videotaped doing all of the presentations she had created to ensure uniformity across the study. A student researcher was chosen to present the information as the focus was on rating student presentations using a more controlled experimental design. The video focused on the slides and included the audio of her voice. The student was not shown on camera to minimize the impact of the presenter.

II. Experiment 1.

A. Method.

1. Design.

This was a between-subjects design, with presentation style as the independent variable. Three presentations on the same topic were created: a 5-minute Pecha Kucha, a 5-minute PowerPoint, and a 10-minute PowerPoint.

2. Participants.

Sixty-seven undergraduate students (51 women; 16 men) at two midwestern college campuses participated in the study. Fliers were posted in the psychology building for one of the campuses and announced in psychology classes on both campuses. Fifty- two percent responded they were between the ages of 18 to 20, and 38% responded they were between the ages of 21 to 23 years. Of the 67 participants, 57 participants fully completed the online rating and memory recall task ($n = 65$ partially completed online questionnaire). Students at one of the universities were offered payment for participating ($n = 43$), and the other university offered course extra credit for a psychology course ($n = 24$). The sample sizes by group, both initially and at follow-up, are displayed in Table 1.

3. Materials.

Presentations. The content of the presentations was adapted from a student presentation the student research assistant had created in an upper level Cognitive Development course. The topic for the presentations was related to cognitive development and had public interest (delaying kindergarten). The presentation focused on defining delayed entry, reasons why to delay entry, disadvantages for delayed entry, and suggestions for parents. The script was identical for the 5-minute presentations and elaborated on for the 10-minute PowerPoint presentation. Presentations were recorded and presented on a large projector screen for each session. There were 15 slides for the Pecha Kucha presentation and 7 slides for both of the PowerPoint presentations. Presentations were recorded and presented on a large projector screen in a classroom for each session. See Appendix for sample slides and spoken content.

  Attention level Rating. Immediately following the presentation, students rated how attentive they were during the presentation on a 5- point Likert scale (1 = *highly distracted*; 2 = *distracted*; 3 = *slightly distracted*; 4 = *attentive*; 5 = *highly attentive*).

  Immediate Presentation Quality Scale. Immediately following the presentation, students evaluated the presenter/presentation on organization, content coverage, voice quality, and visual aids purpose for the presentation using a 5-point Likert type scale (1 = *poor*; 2 = *below average*; 3 = *average*; 4 = *good*; 5 = *excellent*). Visual aids purpose was for the students to rate how effective they felt that the visuals were in supporting the presentation. Students were instructed to compare the presentation to student presentations they have seen in previous classes. The four item scale had high inter-item reliability, α=.77.

  Immediate Recall. Immediately following the presentation, students wrote down points that were made during the presentation. Accurate responses were tallied. Thirty-eight (57%) of

the students wrote down 10 accurate points with the mean number of points made being approximately 8 ($M = 8.62$, $SD = 1.91$). All responses written down were accurate. Students wrote down between 4 and 10 responses.

        Delayed Presentation Scale. Students were asked three questions about the presentation (clarity, visual aids purpose, and overall presentation) on a 5-point scale (1=*poor*; 2=*below average*; 3=*average*; 4=*good*; 5=*excellent*) using an on-line questionnaire. The three items were added together to create an overall mean for the follow-up presentation scale score ($\alpha = .83$).

        Delayed Recognition. Students were asked 10 multiple-choice questions about the content of the presentations in the on-line questionnaire.

B. Procedure.

Students watched a 10-minute PowerPoint presentation, 5-minute Pecha Kucha presentation, or 5-minute PowerPoint presentation depending on the session they signed up for. The groups ranged from 10 to 24 students. Students were told that they would be watching a student presentation, completing a questionnaire immediately afterwards about the student presentation, and then one week later filling out an on-line questionnaire. Students signed informed consent forms. After students watched the video, participants were given a questionnaire to rate the student presentation and provide information they learned from the presentation. The participants were given a website link to complete the second portion of the study one week later. They were also sent a reminder email the day the website link went active letting them know that they had four days to complete the study. The link was not activated until that day to ensure a one-week delay. The online questionnaire asked students to rate the presentation and answer multiple-choice questions about the presentation. Students in all three conditions completed the same follow-up questionnaire.

C. Results.

Descriptive statistics for the rating scales are shown in Table 1.

Attention level Rating
        When asked to rate their attention level during the presentation, students reported a mean rating of 3.5 out of 5 indicating that they were slightly distracted to attentive. Fifty-two percent of the students responded they were either attentive or highly attentive. There were significant differences in the level of distraction between the three conditions, $F(2, 64) = 10.03$, $p < .001$, partial $\eta^2 = .24$. Students in the 5-minute PowerPoint condition self-reported they were less attentive than students in the 5-minute Pecha Kucha or the 10-minute PowerPoint.

Immediate and Delayed Presentation Quality Scales
        There were no significant differences in immediate ratings of the presentation between the three conditions, $F(2, 64) = 0.66$, $p = .52$, partial $\eta^2 = .02$. However, for the delayed presentation scale, there were differences in ratings of the presentation quality between the three conditions, $F(2, 54) = 3.12$, $p = .05$, partial $\eta^2 = .10$. Post hoc analysis (Tukey HSD, p <. 05) indicated that the only significant difference was the 5-minute Pecha Kucha condition was rated as better than the 5-minute PowerPoint   When specifically examining items within the presentation quality scales, the only significant differences was for the immediate and delayed visual aid purpose rating item, $F(2, 64) = 4.73$, $p = .01$, partial $\eta^2 = .13$; $F(2, 54) = 7.20$, $p < .005$,

partial η^2 = .21. For the immediate visual aid purpose rating, Pecha Kucha was rated higher than the 5-minute PowerPoint (Tukey HSD, p < .01). In the delayed visual aid purpose rating question, Pecha Kucha was rated higher than the other two conditions (Tukey HSD, $p \leq$ .006).

Table 1. Exp 1 Means (SDs) for student ratings and responses at Immediate and Follow-up time points.

	Experiment 1			
	Pecha Kucha	5min PPT	10min PPT	Sig diff?
Immediate	(*n*=20)	(*n*=24)	(*n*=23)	
Presentation Quality	15.05 (3.42)	14.17 (3.09)	15.04 (2.51)	ns
Organization	3.95 (.95)	4.08 (.83)	4.35 (.65)	ns
Visual purpose	3.90 (1.12)	2.92 (1.10)	3.22 (1.00)	PK > 5 and 10min PPT **
Voice	3.70 (1.03)	3.79 (1.02)	3.96 (.82)	ns
Content	3.50 (1.00)	3.38 (.92)	3.52 (.99)	ns
Attention level	3.95 (.89)	2.94 (.73)	3.70 (.76)	5min PPT < PK and 10min PPT ***
Recall[a]	8.45 (2.01)	9.17 (1.74)	8.04 (2.46)	ns
1-week Delay	(*n*=18)	(*n*=18)	(*n*=21)	
Presentation Quality[b]	10.83 (3.00)	8.67 (2.54)	9.57 (2.31)	PK > 5min PPT *
Visual purpose	3.61 (1.15)	2.39 (1.24)	2.38 (1.02)	PK > 5 and 10min PPT **
Clarity	3.78 (1.11)	3.33 (.84)	3.86 (.96)	ns
Overall	3.44 (.92)	2.94 (.73)	3.33 (.91)	ns
Recognition	5.11 (1.75)	5.79 (1.38)	5.61 (1.85)	ns

Note. Items were on a 1-5 scale. Scale maximum of 20 unless otherwise noted
[a.]10 points possible. [b.]Scale maximum of 15.
* = p <.05, **= p <.01, ***= p < .001

Immediate Recall and Delayed Recognition

There was no significant difference in immediate recall for listing of accurate points remembered, $F(2, 64)$ = 1.74, p = .18, partial η^2 = .05. Additionally, for the delayed multiple choice questions, there were no significant differences between the three conditions, $F(2, 62)$ = 0.89, p = .41, partial η^2 = .03.

D. Discussion.

The study suggest that Pecha Kucha, with its shorter and pictorially based format, leads to similar retention of the material to the longer traditional format and results in higher ratings for some opinion scales. There were higher ratings for visual purpose of the Pecha Kucha versus a traditional PowerPoint presentation. This may be attributed to students enjoying not having to read any text on the slide. Interestingly, the difference in presentation style and opinion rating does not lead to better retention of the material. One may expect that a longer presentation results in students remembering more information, but this was not the case either. There were no differences in retention. Scores were low overall considering students only answered approximately half of the questions correctly following a one-week delay. This may be due to the fact that the questions were too specific and/or may reflect a lack of investment on the students' part, since the presentation was not related to a course grade.

A surprising finding was that students in the 5-minute PowerPoint presentation rated themselves as significantly less attentive than students in either of the other conditions. It is possible that their difference in attention level was due to the timing of the experiment rather than the type of presentation they watched. Students in the 5-minute PowerPoint section participated immediately after a class meeting, while students participating in the other two groups had a choice of times available.

Although students were assigned to conditions, a potential weakness of the study was the use of a between subjects design. Students did not view all presentation types to examine individual preference. Experiment 2 was designed to account for individual differences and explored differences between a 10-minute PowerPoint and a 5-minute Pecha Kucha. Given that there were no retention or quality rating differences for the 5-minute PowerPoint, we wanted to examine for preferences using the more standard versions of the presentations (e.g., it is not typical for a Pecha Kucha presentation to last for 10 minutes and a 5-minute Power Point would be considered a brief student presentation and not convey as much information as a 5-minute Pecha Kucha). Are there individual differences in retention for 10-minute PowerPoint versus the 5-minute Pecha Kucha presentation? Would students prefer one presentation style/length over the other? Additionally, we included more rating scales to specifically compare the slides in addition to the quality of the general presentation.

III. Experiment 2.

A. Method.

For experiment 2, a within-subjects design was used. The 5-minute Pecha Kucha and 10-minute PowerPoint presentations from experiment 1 were used. Additionally, a 5-minute Pecha Kucha and 10-minute PowerPoint were recorded by the same student research assistant on a different topic (young children watching television). The presentations on this topic focused on educational programming, differences between educational and entertainment television, specific programming that promotes development, and suggestions/reported guidelines for parents. The two Pecha Kucha presentations were designed to be similar in word count and number of sentences, and the two PowerPoint scripts were designed to be similar in word count and number of sentences. The scripts for Pecha Kucha and PowerPoint presentations were based on the same

outline but included some elaboration of the material for the 10-minute PowerPoint presentations.

B. Participants.

Seventy-four undergraduate students (60 women; 14 men) enrolled in four undergraduate developmental psychology courses at two college campuses gave permission to participate in the study. Fifty-seven students participated in both class sessions (n = 56 fully completed), and of those students, 38 participated in both of the follow-up online measures (n = 33 fully completed). For demographics, 47% of the 74 students responded they were between the ages of 18 to 20, whereas 45% responded they were between the ages of 21 to 23 years (8% did not respond to question).

C. Materials.

Presentations. Students saw two of the four presentations, one on each topic. There were four total conditions. Half of the students watched a 5-minute Pecha Kucha on one topic and then a 10-minute PowerPoint on the other topic while the other half of the students watched a 10-minute PowerPoint presentation first and a 5-minute Pecha Kucha second.

For both presentation topics, there were seven slides for the PowerPoint and 15 slides for the Pecha Kucha. The Pecha Kucha slides were 20 seconds in length and only had images to convey the speaker's message. The PowerPoint presentation added elaboration of the material and had text with no images on the slides.

Attention level Rating. Students completed the same question about their attention level as described in Experiment 1.

Immediate Presentation Scale Ratings and Recall. Students completed the same 4-item presentation quality scale (α = .76) and open-ended recall question as described in Experiment 1. A new scale (slide quality) was developed for students to evaluate specific aspects of the slides (message, effectiveness, interest, appeal) using a 5-point Likert scale (1=*definitely*; 2=*adequately*; 3=*neutral*; 4=*inadequate*; 5=*definitely not*). The 4-item scale had high inter-item reliability, α=.76. Like experiment 1, students wrote down up to ten points they remembered from the presentation for each condition. Across all participants, all but two statements written down were coded as accurate (i.e., 98% of all statements were accurate).

Delayed Presentation Scale Ratings and Recognition. The same 3-item delayed presentation scale was used as Experiment 1, α = .75. The online recognition questions from Experiment 1 were used for the kindergarten entry presentations. New memory questions were developed for the television topic. Students with the same topic received the same online questions regardless of presentation style. There were ten multiple-choice questions for each topic.

D. Procedure.

Prior to starting Experiment 2, four psychology students rated the slides and scripts from the four presentations for consistency in topic interest. For each item, ratings were based on a 5-point Likert scale (1 = *definitely interesting*; 2 = *adequately*; 3 = *undecided*; 4 = *inadequately*; 5 =

definitely not). All raters rated the slides as either 1 or 2 for each of the statements, *M*s = 1-1.75, *SD*s = 0-.58. Seventy-five percent of the raters preferred the television topic.

The procedure used in the current experiment was similar to the procedure used in Experiment 1, adapted for a within-subjects design such that each student completed two study sessions and two online questionnaires. In this experiment, the second presentation occurred seven weeks after the first session. The session conditions were randomized by the experimenters to ensure that each student watched two different topics and two different presentation styles in the study sessions. A total of 43 students across two classes saw the PowerPoint first, and 31 students across two classes saw the Pecha Kucha first.

E. Results.

Because of varying degrees of study completion, analyses were performed in two ways. Once as repeated measures analyses, for students who completed the entire study and then as between subjects analyses examining those students who completed any session. There were no contradictory findings between these two types of analyses and so only the repeated measures analyses are reported. Descriptive statistics are presented in Table 2.

Attention level Rating

There were no significant differences in the self-reported level of distraction between the Pecha Kucha and PowerPoint conditions, $t(48) = 1.05$, $p = .30$, $d = .14$.

Immediate and Delayed Presentation Quality Scales.

Descriptive statistics for the presentation ratings scales are shown in Table 2. When asked to rate the overall presentation immediately following each presentation, there were no differences in the student ratings, $t(56) = 1.69$, $p = .10$, $d = .28$. When examining individual items within the scale, the visual aid purpose rating item was higher for Pecha Kucha than the 10-minute PowerPoint, $t(58) = 3.96$, , $p < .001$, $d = .52$.

Immediately following the presentations, students were also asked to rate message, effectiveness, interest, and appeal (slide quality scale). For this scale, students rated the PowerPoint slides significantly higher, $t(55) = 3.71$, $p < .001$, $d = .62$. For this scale, a higher score indicates a lower slide quality.

There were significant differences for the delayed presentation scale, $t(29) = 2.23$, $p = .03$, $d = .60$, such that Pecha Kucha was rated higher than the PowerPoint (see Table 2). When specifically examining items within the presentation scales, the delayed visual purpose item was rated significantly higher for the Pecha Kucha condition than the PowerPoint condition, $t(31) = 3.57$, $p = .001$, $d = 1.89$. There were no significant differences when examining the immediate presentation scales by topic (kindergarten [$M = 14.49$, $SD = 2.53$] and television [$M = 15.11$, $SD = 2.46$]), $t(56) = -1.45$, $p = .15$, $d = .21$. Additionally, there were no significant differences when examining the delayed presentations scale by topic (kindergarten [$M = 9.48$, $SD = 1.88$] and television [$M = 9.90$, $SD = 1.90$]), $t(30) = .90$, $p = .38$, $d = .22$.

A subset of students ($n = 40$) responded to questions that explicitly asked about preference for topic and preference for style. Fifty-five percent of the students reported that they preferred the educational TV topic, 30% preferred the delaying kindergarten topic and 15% had no preference. For style, 37.5% preferred the traditional PowerPoint, 35% preferred the Pecha Kucha and 27.5% had no preference.

Table 2. Exp 2 Means (SDs) for student ratings and responses at Immediate and Follow-up time points.

	Pecha Kucha	10min PPT	Sig diff?
Immediate			
Presentation Quality	15.18 (2.73)	14.47 (2.24)	ns
Organization	4.03 (.79)	4.07 (.64)	ns
Visual purpose	3.78 (1.00)	3.05 (.99)	PK>PPT***
Voice	3.75 (.92)	3.85 (.87)	ns
Content	3.58 (.79)	3.39 (.79)	ns
Slide Scale [a]	10.21 (3.52)	12.12 (2.66)	PK more positive than PPT ***
Message	2.14 (1.06)	2.43 (.91)	ns
Interest	2.69 (1.02)	3.20 (.87)	PK more positive than PPT **
Effectiveness	2.31 (.92)	3.10 (.87)	PK more positive than PPT ***
Appeal	2.66 (1.09)	3.38 (.95)	PK more positive than PPT ***
Attention level	3.38 (.93)	3.22 (.80)	ns
Recall[c]	8.12 (2.23)	6.53 (3.00)	PK > PPT ***
1-week Delay			
Presentation Quality[d]	10.13(1.48)	9.17 (1.74)	PK > PPT *
Visual purpose	3.34 (.79)	2.65 (.79)	PK > PPT ***
Clarity	3.52 (.78)	3.49 (.72)	ns
Overall	3.22 (.76)	3.02 (.81)	ns
Recognition	5.45 (1.82)	5.79 (.99)	ns

Notes. Items were on a 1-5 scale. Unless otherwise noted scale maximum of 20.
[a.] Higher score reflect less favorable ratings. [b.] 10 points possible. [c.] Scale maximum of 15.
* = p <.05, **= p <.01, ***= p < .001

Immediate Recall

Significant differences in immediate recall were found based on topic and presentation style. There were differences in immediate recall between the two presentation styles, $t(48) = 3.98$, $p < .001$, $d = .60$. More specifically, students recalled more information in the Pecha Kucha condition than in the PowerPoint condition. Additionally, there was a significant difference in immediate recall by topic for listing of points remembered, $t(48) = 2.23$, $p = .03$, $d = .36$, where students remembered more Kindergarten points ($M = 7.82$, $SD = 2.46$) than TV topic points ($M = 6.84$, S$D = 2.96$).

Delayed Recognition

Students remembered similar amounts of information a week after the presentation regardless of presentation style, $t(32) = .92$, $p = .37$, $d = .23$. This suggests that amount of time spent discussing the material and the additional detail included in a 10-minute presentation were not beneficial for students' retention of the material. Performance on the delayed recognition task was found to differ by topic. Unlike the initial immediate recall listing, students answered more

questions correctly for the Television topic ($M = 6.18$, $SD = 1.21$) than the Kindergarten topic ($M = 5.00$, $SD = 1.54$), $t(32) = -3.68$, $p = .001$, $d = .85$.

F. Discussion.

Pecha Kucha was rated higher than the PowerPoint for the immediate and follow-up ratings. There also was an order effect of ratings such that those who saw a Pecha Kucha following the PowerPoint presentation rated the Pecha Kucha more favorably, suggesting a comparison effect. Although students initially remembered more information for the Pecha Kucha presentations, there were no differences in recognition for the follow-up questions. Interestingly, students initially wrote down more information about the Kindergarten topic, but then remembered more for the Television topic.

IV. General Discussion.

The purpose of the experiments was to determine if there were differences in student presentation quality ratings, recall, and recognition when using an image-only, fast paced, timed presentation style (Pecha Kucha) compared to the traditional PowerPoint presentation style. The overall findings suggest some preference for Pecha Kucha versus a traditional PowerPoint peer presentation, without differences in retention of the material.

For the PowerPoint presentation, although the information was reinforced with text on the slides, students did not show improved retention of the information. In fact, in Experiment 2 students recalled more information from the Pecha Kucha presentation than the PowerPoint, immediately following the session. Although the information was reinforced with text in the PowerPoint, students may have been distracted from the verbal presentation by the text. There were no differences in the delayed recognition for either experiment.

The similarity of retention across the presentation types supports the utility of Pecha Kucha for student presentations. From an instructor's perspective, Pecha Kucha offers a shorter time frame for student presentations and perhaps has advantages to the presentations being more practiced and engaging for the audience (Beyer, 2011). With automated slides, student Pecha Kucha presentations are always completed in the set time limit.

Students rated the Pecha Kucha presentation more favorably on the slide presentation scale compared to the PowerPoint. This is interesting because the slides in the Pecha Kucha have little meaning outside of the presentation. The audience does not have text on the Pecha Kucha slide to reinforce the point made by the presenter. Perhaps having limited text is more appealing to an audience as previous research has found that students can be distracted from what the speaker is saying (Savoy et al., 2012). Additionally, students using Pecha Kucha may also have an advantage of a generation effect versus reading from a slide that has been shown to improve recognition (e.g., Slamacka & Graf, 1978).

In Experiment 2, the Pecha Kucha presentation received a high overall presentation rating than the traditional PowerPoint presentation. Although the overall presentation scale ratings were not higher for Experiment 1, students rated the visual purpose item in that scale for Pecha Kucha higher than PowerPoint. It may have been simple for students to see the connection of the image to the message.

These experiments are not without limitations. The sample sizes were small with participants coming from two liberal arts colleges in the Midwest, and the majority of the

participants were female which reflects the colleges' populations. Although efforts were made to randomize presentation styles, there were group differences for a topic effect in Experiment 2. Both topics selected for Experiment 2 were based on cognitive development topics, but perhaps the Television topic was more relatable or inherently interesting. Surprisingly, students wrote down more correct items learned for the Kindergarten topic immediately after the presentation than for the Television topic. However, students answered more Television topic multiple-choice questions correctly than Kindergarten questions on the online recognition task. Perhaps the Television questions were easier than the Kindergarten, even though efforts were made to create similar questions across topics. Overall, retention scores were low for both experiments. This could be due to the difficulty of the questions, or students' investment in learning the material as it was outside of a class and their performance on the questions had no connection to their grades. Additionally, the questions for both topics were factual and specific to the presentation. These questions may have been challenging for students, as they were not explicitly told that they would be tested on the material. The dropout rate for the second study was substantial as only 50% of students completed all parts of the study. Students had the convenience of on-line follow-up questionnaires, incentives for completing all phases, and email reminders; all which were not sufficient to motivate all students to complete the study.

It is important to note several characteristics of the presentations used in this study before generalizing the findings to student presentations. First, while the presenter was a student, the quality of the presentation was high. The presentation was carefully scripted, visuals were critically examined, and she avoided the pitfalls of many PowerPoint presentations. Individual differences in student presentation quality would be expected for class presentations. Second, the presentation was videotaped for consistency across study sessions and the student presenter was not pictured in the video. Presenter eye contact and body movement were not included in the presentation, which may have impacted the study results.

While we have discussed the potential advantages of Pecha Kucha as a presentation style, this presentation style may be more appropriate for a student presentation rather than a lecture. The fast, automated pace is not optimal for an active learning situation allowing students to ask questions and engage in the lecture as the automated pace limits faculty-student interaction. Moreover, faculty could not pause to assess student comprehension and elaborate on points as needed. Furthermore, some material for lecture may not lend itself well to Pecha Kucha. If faculty are to use Pecha Kucha, it may be more appropriate for review material rather than new material because of the limited interaction and fast pace of the slides. The fast pace may tax processing capacity for the student as new, challenging material is being presented.

Pecha Kucha presentations would be appropriate for student presentation of review topics, general topic overviews, and material that ties into the course but is not a specific empirical study. Pecha Kucha may not lend itself well to specific empirical work due to the pace of the slides. Pecha Kucha would be appropriate in nearly any course depending on the topics being presented. Pecha Kucha has been used for student introductions in a first-year seminar in addition to art student presentations of their senior capstone project.

As a student presentation style, it forces students to be more familiar with their material and reduces the mistakes often seen with traditional power-point slides. For example, student presenters would also have better eye contact and avoid reading from the slides. With its set time, it would keep presentations running on time, and the faster pace may also be more appealing and interesting for students listening to numerous student presentations. Pecha Kucha would help student presenters avoid having conflicting audio and visual messages that would

reduce the audience's cognitive load. A faster paced presentation may also be more appealing and interesting for students listening to numerous student presentations.

Pecha Kucha may also be a valuable tool for student presenters' understanding and retention of the content they present. Although no differences were seen for immediate recall or recognition for the students listening to the presentations, there likely could be an effect of stronger retention of the material for the student presenters themselves. The student presenter is forced to become more familiar with the content of the presentation because they do not have text on the slide to read from. Indeed, Beyer and Earle (2009) found that when students presented a class concept using Pecha Kucha during an exam review activity, they answered the exam question correctly (both multiple choice or short answer questions). Although it was not the focus of the current study, future research should evaluate the impact of the Pecha Kucha on students' retention of material from their own presentation.

The current study builds upon previous work on improving student presentation skills. Examining student presentations skills is an important component of general education. Many colleges and universities, as well as associations such as APA, have included oral communication proficiency as a student outcome. In addition to improving student speaking skills, teaching students about Pecha Kucha fits well with APA's learning goal seven, students' ability to communicate effectively in a variety of formats (Halonen et al., 2002; also see Dunn, McCarthy, Baker, Halonen, & Hill, 2007).

Learning to do Pecha Kucha may also give students better visual design literacy. After all, Pecha Kucha was developed by architects Mark Dytham and Astrid Klein as a creative presentation style (Klein Dytham architecture, 2008). After preparing a Pecha Kucha presentation, students may have better visual design skills as a result of preparing each image to map their intended message with virtually no text on the slides. This skill could carryover to traditional PowerPoint presentations used in other settings, encouraging students to reduce their use of text on slides and increase use of visual images. Students watching these presentations may also be more conscientious in their own use of text and images when creating a traditional PowerPoint presentation. Thus, Pecha Kucha may be another useful skill for students entering the workforce.

In sum, Pecha Kucha is a worthwhile type of student presentation to consider using in courses. First, in the interest of managing class time, student presentations will always end on time using the paced timing. Students retained as much information from Pecha Kucha as traditional PowerPoint, with a slight advantage for Pecha Kucha in immediate recall. Additionally, students seem to like the new presentation style. The new style may also promote visual design literacy while building oral communication skills.

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Appendix

5 and 10 minute PPT sample slide
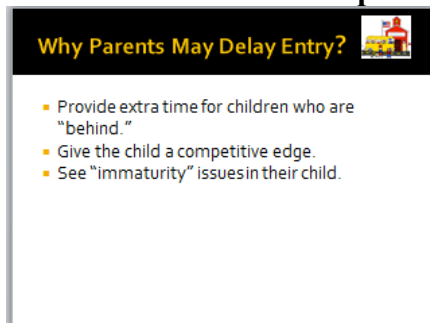
5 minute PPT spoken content (10 minute added information in italics)
There are several reasons why parents may choose to delay their child's kindergarten entry. The most common reason is because parents believe that it will provide extra time for their child to catch up if they are believe to be behind. Children entering kindergarten are expected to know a list of various items, such as the alphabet, how to write their name, and a majority of the numbers, and when a child does not know these things, a parent may delay their entry so they can learn them. *Some researchers suggest that schools expect children to be ready when they come to school rather than acquiring readiness in kindergarten. Therefore, parents use that extra year to ensure that their child is in fact ready for school rather than the child making adjustments while in kindergarten. Escalated curriculum also makes parents and teachers fearful that young 5-year-olds will fail.*

Some parents believe that by delaying a child's kindergarten entry, it will give them a competitive edge over his or her peers. This competitive edge parents believe they are giving their child can be an academic advantage, social advantage, or later on in schooling, a sports advantage.

If parents see an immaturity issue in their child, they may choose to delay entry as well. This, however, may not be the best option for the child because it could stem from underlying issues, *which will be discussed later*.

Two sample Pecha Kucha slides for corresponding PPT slides above

Pecha Kucha spoken content

Slide 1: There are several reasons why parents may choose to delay their child's kindergarten entry. The most common reason parents delay their child's kindergarten entry is to provide extra time for their child to catch up if they are believed to be behind. Children entering kindergarten are expected to know a list of various items and when a child does not know them, a parent may delay entry so they can learn them.

Slide 2: Some parents believe that by delaying a child's kindergarten entry, it will give them a competitive edge over his or her peers. This competitive edge parents believe they are giving their child can be an academic advantage, social advantage, or later on in schooling, a sports advantage.

Sample multiple-choice question

Why do parents delay Kindergarten entry?

a. Competitive edge
b. Costs involved
c. Given the child more time before schooling starts
d. A and C

Immediate questionnaire

Please provide us 4-digits (birth month and birthdate) and the last letter of your first name

_____

On a scale of 1 (poor) to five (excellent), please compare this presentation to student presentations you have seen in classes: (circle 1 per item)

   1 *poor*   2 *below average*   3 *average*   4 *above average*   5 *Excellent*

Poor   **Avg**   **Excellent**
1   2   3   4   5   Introduced motivation and interest in topic/problem

1   2   3   4   5   Coherent pattern of organization

1   2   3   4   5   Voice quality

1   2   3   4   5   Visuals suited purpose

Use the following 5-point scale for the next 4 questions, rate the presentation. (circle 1 per item)
   1 *definitely* 2 *adequately*   3 *neutral*   4 *inadequate*   5 *definitely not*

1   2   3   4   5   The slides captured the message being conveyed.

1   2   3   4   5   The slides appearance was effective.

1   2   3   4   5   The slides were interesting.

1   2   3   4   5   The appearances of the slides were appealing.

What were ten concepts or pieces of information that you learned from the presentation?

On a scale of 1 to 5, how would you describe your attentiveness during the presentation?
1 (very distracted) 2 (distracted) 3 (slightly distracted)   4 (attentive)   5 (highly attentive)

Online follow-up questionnaire
What was the month and day you were born (put as 4-digits)?

What is the last letter of your first name?

What were 3 recommendations made during the presentation?

On a scale of 1 (poor) to five (excellent), please compare this presentation to student
presentations you have seen in classes: (circle 1 per item)
   1 *poor*   2 *below average*   3 *average*   4 *above average*   5 *great*
        Overall presentation
        Visuals suited purpose
        Clarity of materials presented
[10 multiple choice questions based on topic condition]
Please indicate your gender.
Please indicate your age range.