

## Assessing the Impact of Interactive Sampling Using Audience Response Systems – Appendix

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## **ARS Research Project**

Experiment Booklet

IntroPsych TA:\_\_\_\_\_

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## **HEQCO – ARS EXPERIMENT BOOKLET**

Dear IntroPsych TA,

This booklet will assist you in providing your students with standardized information and instructions for an experiment that is taking place this Fall (2012), with consenting IntroPsych students as participants.

# DO NOT leave this book in your tutorial room. Please prep before the tutorial commences, and only refer to the instructions when required to read the script or when it is absolutely necessary.

If you have any questions, please contact Irina Ghilic, the Project Coordinator, via email: <u>ghilicai@mcmaster.ca</u>.

#### Background Info

Audience Response Systems (ARS) have been in use for over 30 years and have enjoyed an exponential growth in the past 10 years (see Kay & LeSage, 2009 for a recent review). However, in most cases, the devices, which allow an instructor to collect information in real time from the entire classroom, have been used to explore understanding and comprehension of a concept. Typically, a multiple-choice question is presented via slide presentation software and students provide a response. The aggregate responses are then displayed on the screen. We found very few examples where real research questions were posed and data collected using these devices (Cleary, 2008; McGowan & Vaughan, 2011; Micheletto, 2011). For example, imagine teaching the concept of a normal distribution. Typically, a plot is shown where height is plotted on the x-axis and frequency is plotted on the y-axis and the data are drawn from standardized tables available on-line or in a textbook. If instead, the students are asked to enter their heights using the ARS and their actual data are presented, the students will feel much more involved with the data and their interpretation.

We propose that the use of Audience Response Systems (iclickers), to create experimental data and analysis, leads to deeper cognitive engagement and subsequent improvements in initial learning and later retention, compared to the same ideas presented in summary data taken from a published source.

#### References:

- Cleary, A. M. (2008). Using Wireless Response Systems to Replicate Behavioral Research Findings in the Classroom. Teaching of Psychology, 35(1), 42-44.
- Kay, R.H. & LeSage, A. (2009) Examining the benefits and challenges of using auditence response systems: A review of the literature. Computers & Education, 53, 819-827.
- McGowan, H. M., & Vaughan, J. (2011). Testing a Student Generated Hypothesis Using Student Data. Teaching Statistics, doi:10.1111/j.1467-9639.2010.00452.x
- Micheletto, M. J. (2011). Conducting A Classroom Mini-Experiment Using An Audience Response System: College Teaching, 8(8), 1-8.

#### **Teaching Conditions**

The experiment will focus on teaching three different concepts throughout the term, by using three teaching methods:

- 1. *Traditional Lecture*: Students will be presented with information drawn from textbooks or journal articles, thus following a passive learning approach.
- 2. Pen & Paper Demonstration: Class demonstration data will be collected during tutorial time by having students write their responses on paper and handing in their papers to the Teaching Assistant. The TA will then analyze the data and provide a tutorial specific, personalized teaching example during next week's tutorial. This method follows an active learning approach, with providing delayed feedback.
- 3. *iClicker Demonstration*: Class demonstration data will be collected during tutorial time by having students answer the questions with their iClickers. The TA will then immediately analyze the data and provide a tutorial specific, personalized teaching example during the current tutorial. This method follows an active learning approach, with providing instant feedback.

Below you will find a schedule of experimental concepts and their respective tutorial/teaching method. Be advised that you might have to teach an experimental concept using different teaching methods, depending on your tutorial number. Please prepare accordingly for whatever teaching methods you will be employing during your tutorials.

	Concept 1	Concept 2	Concept 3
Traditional Lecture	Tutorials 1 - 38	Tutorials 77 - 116	Tutorials 39 - 76
Pen & Paper	Tutorials 39 - 76	Tutorials 1 - 38	Tutorials 77 - 116
iClicker	Tutorials 77 - 116	Tutorials 39 - 76	Tutorials 1 - 38

EC01-100	
EC02-101	For example, Timmie Li is TA-ing tutorials 20, 23 & 53.
EC03-102	
EC04-103	He will be using the Traditional. Traditional and Pen& Paper
EC05-104	lectures styles for Research Methods (concept 1)
EC06-105	
EC07-106	He will be using Pen&Paper. Pen&Paper and iclicker lecture
EC08-107	styles for Categories&Concepts (concept 2)
EC09-108	
EC10-109	He will be using iclicker, iclicker and Traditional lecture styles
EC11-110	for Forming Impressions (concept 3)
EC12-111	
EC13-112	
EC14-113	
EC16-114	-You're welcome. Timmie
EC19-115	
EC20-116	

\*\*\*Note: Tutorials E C01through EC 20 are equivalent to Tutorials 100 through 116

#### Experimental Concept Tutorials – Steps to follow

At the beginning of an experimental tutorial, you will unlock the cabinet underneath the computer and take out the iClicker box, **ONLY IF YOU ARE TEACHING THE ICLICKER CONDITION**. You will then proceed to hand out the iClickers as students enter the class. **Students are not permitted to exit the classroom with the iClickers.** Please make sure to take attendance before the class starts. Arriving 10 min early to your tutorial will help you stay on track with the lesson plan.

Briefnotes and PowerPoint slides for each of the experimental concept tutorials can be found in this booklet. Make sure you use the appropriate PowerPoint presentation, depending on the experimental teaching method.

#### About the concepts:

The concepts you will be teaching as part of the experiment are regular concepts, just taught in 3 different ways across tutorials. There is nothing special about these topics. You will be spending an average of 5-10 minutes on these concepts during your tutorial. Do not exaggerate their importance.

Imagine you are teaching your students about classical conditioning. You might want to explain this concept by talking about Pavlov, and give students a clear and easy explanation of classical conditioning, OR you might choose to explain it by showing your students a YouTube video of a classical conditioning experiment. Now, say you want to test which one of these methods is more effective, IF there is a difference in the first place, and if there isn't, to ask yourself why.

This is exactly what we are trying to do with this experiment. Teach some concepts in different ways, and see which of the teaching methods is more effective, or if there is a difference in the first place. Thus, <u>DO NOT treat the experimental concepts as something extraordinary</u>. Try to incorporate them in your tutorial in a seamless fashion.

#### **Teaching Conditions Revisited**

- Traditional: Explain the concept as it was outlined in your briefnotes and slides.
- Pen & Paper: Present the demo, instructing students to fill in their answers on the provided papers
  - You will then collect the papers and present the demo results online, on Thursday night (after the last tutorial of the day)
- iClicker: Present the demo, collect the data, present the results of the demo, according to your briefnotes guidelines.

#### **Research Methods Concept – Normal Distribution**

#### **Traditional Lecture Style**

The Traditional Lecture Style is very straightforward. You are teaching a concept by the book. Not by asking students questions or by collecting data from students. You are just showing them data that was already collected, and an example of a <u>generic bimodal</u> <u>distribution (not the class's actual distribution)</u>. The students are passively absorbing this information.

Below you will find the PowerPoint slides and briefnotes relevant to this concept. For the rest of the tutorial, follow the slides and briefnotes provided to you via AVENUE TA discussion board.

#### **Presentation Slides**



#### **Briefnotes**

#### Statistics

[...] centered, while measures of variability tell us how our values fall around the center or typical value.

"See this data set, for example. Take a few seconds to look at the numbers (allow students about 20 sec. to read through the numbers). This data set represents the heights of 24 IntroPsych students, from a past year. The mean of their heights was approx.. 169cm, the mode 162cm, and the median 168.5cm. When plotted, the data formed a bimodal distribution. This tells us that our data is centered around 2 values instead of 1, possibly differentiating between the heights of females vs. males in the class. We also see that there is quite a variability in heights."

Inferential statistics allow us to use [...]

#### Pen & Paper Lecture Style

This is your typical class demonstration of a concept. Instead of just showing your students data collected and analyzed by other parties, you try to somehow bring that research to

class, and personalize the example. What's important to remember about the Pen & Paper Lecture style is **showing your students their personalized example the following class.** 

#### Presentation Slides



#### **Briefnotes**

#### Statistics

[...] or typical value.

"Let now take a look at your tutorial's own height distribution. Please take out a piece of paper.

Write down your height on the piece of paper. I will collect the papers and will show you your class's height distribution during next week's tutorial"

Inferential [...]

NEXT CLASS, beginning of class: Present Experiment Concept data (Approx. 1-2 minutes)

(show students their distribution of heights)

"This is your normal distribution of heights, at a glance. The mean of your heights is around \_\_\_ (see where the spike in the distribution lies) and the median is around \_\_\_ (again, see the centre of the data).

You might get a bimodal distribution. The point is showing students how most of the data is centered around the mean, and what the variability around the centre says about the data. If most of the data is close to the centre, that means most students are fairly close in terms of height. If the data is quite spread out, there is more variability in your class in terms of heights. If you see a bimodal distribution, it helps to differentiate between groups. For example, the female population might have a distribution on the lower end of height values, whereas males might be centered around the higher height values. "

#### iClicker Lecture Style

These lecture slides and mechanics are very similar to Pen & Paper teaching condition. However, instead of waiting for next class to show your students their results, you will have to do this on the spot, in tutorial. Instructions can be found in the iclicker (last) section of this booklet.

#### **Presentation Slides**



#### **Briefnotes**

#### **Statistics**

[...]typical value.

"Let now take a look at your tutorial's own height distribution. Please make sure you have your iclickers turned on.

Please enter your height in feet. For example, a height of 5'6'' would be entered as 5.6. (Please refer to the "iclicker" section of your booklet, which explains in detail how to ask a numeric question and how to present the data to the students).

This is your normal distribution of heights, at a glance. The mean of your heights is around \_\_\_\_ (see where the spike in the distribution lies) and the median is around \_\_\_\_ (again, see the centre of the data).

You might get a bimodal distribution. The point is showing students how most of the data is centered around the mean, and what the variability around the centre says about the data. If most of the data is close to the centre, that means most students are fairly close in terms of height. If the data is quite spread out, there is more variability in your class in terms of heights. If you see a bimodal distribution, it helps to differentiate between groups. For example, the female population might have a distribution on the lower end of height values, whereas males might be centered around the higher height values. "

Inferential [...].

#### **Categories & Concepts – Forming Rules**

#### Traditional Lecture Style

The Traditional Lecture Style is very straightforward. You are teaching a concept by the book. Not by asking students questions or by collecting data from students. You are just showing them data that was already collected, and showing them a table. The students are passively absorbing this information.

Below you will find the PowerPoint slides and briefnotes relevant to this concept. For the rest of the tutorial, follow the slides and briefnotes provided to you via AVENUE TA discussion board.

F	orming R	ules		Forming Rules
	Μ	lake a rule for category 'Fru	the it'	Does your rule include all these items? <ul> <li>Melon</li> <li>Coconut</li> <li>Grape</li> </ul>
"- tr a	The swe ee or ot nd can l	eet and fleshy pr her plant that co be eaten as food	roduct of a ontains seed d"	<ul> <li>Does your rule exclude all these items?</li> <li>Squash</li> <li>Almond</li> <li>"The sweet and fleshy product of a tree or other</li> </ul>
F	orming R	ules		plant that contains seed and can be eaten as food
F %yes	orming R	ules Include	But not	plant that contains seed and can be eaten as food
<b>F</b> %yes 84%	orming R Category table	ules Include coffee table, pedestal	But not bed, counter, iron board	plant that contains seed and can be eaten as food
<b>F</b> %yes 84% 88%	Category table bottle	ules Include coffee table, pedestal baby bottle, pill bottle.	But not bed, counter, iron board jar, glass, carton	plant that contains seed and can be eaten as food
<b>F</b> %yes 84% 88% 64%	Category table bottle dog	ules Include coffee table, pedestal baby bottle, pill bottle. Chihuahua, greyhound	But not bed, counter, iron board jar, glass, carton wolf, fox, coyote	plant that contains seed and can be eaten as food
<b>F</b> %yes 84% 88% 64% 84%	Category table bottle dog tree	ules Include coffee table, pedestal baby bottle, pill bottle. Chihuahua, greyhound sapling, pine, palm, bonsai	But not bed, counter, iron board jar, glass, carton wolf, fox, coyote bush, vine, bamboo	plant that contains seed and can be eaten as food
<b>F</b> <b>%yes</b> 84% 64% 84%	Category table bottle dog tree fruit	ules Include coffee table, pedestal baby bottle, pill bottle. Chihuahua, greyhound sapling, pine, palm, bonsai melon, coconut, grape	But not bed, counter, iron board jar, glass, carton wolf, fox, coyote bush, vine, bamboo squash, almond	plant that contains seed and can be eaten as food

Goals of this tutorial:

✓ Briefly review core concepts from the Categories & Concepts lectures

Activity: Forming Rules: (Approx 5 minutes)

Recap the experiment that Dr. Lee Brooks performed on forming rules. "In his experiment, Dr. Brooks asked participants to form rules for several categories. Let's focus on the category "fruit". An example of a rule for the category "fruit" is:

"The sweet and fleshy product of a tree or other plant that contains seed and can be eaten as food."

Then he asked his participants is their rule include items such as melon, coconut, grape, but exclude items such as squash and almond. The percentage of YES responses was 40%. The more ambiguous the category (as seen in the table), the lower percentage of YES responses from the participants, and the more complicated the rules become. Rules can't possibly account for all the variation. Thus, categorizing based on rules is illogical, since categories are way too complex and have too much overlap to be exclusive. " Case Study Review: (Approx 20 minutes) –Needs Expansion from current [...]

#### Pen & Paper Lecture Style

This is your typical class demonstration of a concept. Instead of just showing your students data collected and analyzed by other parties, you try to somehow bring that research to class, and personalize the example. What's important to remember about the PP Lecture style is **showing your students their personalized example the following class**.

<b>F</b>	orming R	ules		Forming Rules
	Ν	/Jake a rule fo category 'Fru	r the ıit'	Does your rule include all these items? <ul> <li>1. Melon</li> <li>2. Coconut</li> <li>3. Grape</li> </ul> Does your rule exclude all these items? <ul> <li>4. Squash</li> <li>5. Almond</li> </ul> A. YES <ul> <li>B. NO</li> </ul>
F	orming R	ules		Past data: %YES and %NO responses
%yes	Category	Include	But not	
84%	table	coffee table, pedestal	bed, counter, iron board	60
88%	bottle	baby bottle, pill bottle.	jar, glass, carton	50
64%	dog	Chihuahua, greyhound	wolf, fox, coyote	
84%	tree	sapling, pine, palm, bonsai	bush, vine, bamboo	
40%	fruit	melon, coconut, grape	squash, almond	10
56%	furniture	rug, chair, desk	table saw	0 VIS NO

#### Activity: Forming Rules: (Approx 10 minutes)

Ask the class to try and formulate a set of rules that encompass all possible fruit. Let them do this, and choose to write down one rule on a whiteboard (choose a rule that you think might show the students findings similar to Lee Brook's findings). Then present the class with the names of different fruit, and ask them to answer YES or NO to the question on the slide, and write out their answers on a piece of paper (TAs will ask the question for each of the 5 fruits). Let them know that their own data will be posted on their AVENUE discussion board on Thursday, after the last tutorial for that day. Present the class with the findings from Lee Brook's experiment. The percentage of YES responses was 40%, for the category of fruit in his experiment. The more ambiguous the category (as seen in the table), the lower percentage of YES responses from the participants, and the more complicated the rules become. Show them data that we collected in previous years, by asking the students the same questions. Proceed to tell the class how rules cannot account for all the variation within a category. Thus, categorizing based on rules is illogical, since categories are way too complex and have too much overlap to be exclusive.

#### **Case Study Review**

#### iClicker Lecture Style

These lecture slides and mechanics are very similar to Pen & Paper teaching condition. However, instead of waiting for next class to show your students their results, you will have to do this on the spot, in tutorial. Instructions can be found in the iclicker (last) section of this booklet.



_			
%yes	Category	Include	But not
84%	table	coffee table, pedestal	bed, counter, iron board
88%	bottle	baby bottle, pill bottle.	jar, glass, carton
64%	dog	Chihuahua, greyhound	wolf, fox, coyote
84%	tree	sapling, pine, palm, bonsai	bush, vine, bamboo
40%	fruit	melon, coconut, grape	squash, almond
56%	furniture	rug, chair, desk	table saw

#### Goals of this tutorial:

✓ Briefly review core concepts from the Categories & Concepts lectures

#### Activity: Forming Rules: (Approx 7-10 minutes)

Ask the class to try and formulate a set of rules that encompass all possible fruit (divide the class into 6 groups and give them 3 minutes to come up with a rule). Let them do this, and choose to write down one rule on a whiteboard (choose a rule that you think might show the students findings similar to Lee Brook's findings). Then present the class with the names of different fruit, and ask them to answer YES or NO to the question on the slides. (TAs will ask the question for each of the 5 fruits).

Present the class with the findings from Lee Brook's experiment. The percentage of YES responses was 40%, for the category of fruit in his experiment. The more ambiguous the category (as seen in the table), the lower percentage of YES responses from the participants, and the more complicated the rules become.

Now show the class their data (please attend the tutorial preview on Friday, October 19<sup>th</sup>, 1:30PM, for a live demonstration). Hopefully, the class's data follows along with the findings. Proceed to tell the class how rules cannot account for all the variation within a category. Thus, categorizing based on rules is illogical, since categories are way too complex and have too much overlap to be exclusive.

Case Study Review: (Approx 20 minutes) -Needs Expansion from current state

#### Forming Impressions – Availability Heuristic

#### **Traditional Lecture Style**

The Traditional Lecture Style is very straightforward. You are teaching a concept by the book. Not by asking students questions or by collecting data from students. You are just showing them data that was already collected, and showing them a graph. The students are passively absorbing this information.

Below you will find the PowerPoint slides and briefnotes relevant to this concept. For the rest of the tutorial, follow the slides and briefnotes provided to you via AVENUE TA discussion board.

#### **Presentation Slides**





#### Availability Heuristic

- Students considered the medical label of the recently medicalized disease to be more serious than the same disease described using common language. A similar pattern was not seen in the established medical conditions, even when controlled for severity. This study demonstrates that the use of medical language in communication can induce bias in perception
- A simple switch in terminology results in a disease being perceived as more serious, more likely to be a disease, and more likely to be a rare condition, due to the only information that is available to us when we hear a new medical term: the more complex the term is, we tend to assume that the underlying disease is more serious.

#### Experimental Concept: Availability Heuristic (Approx. 10 minutes)

"Let's look at an example of how the availability heuristic can play a role in our medical perceptions. A study conducted by researchers within the Department of Psychology, Neuroscience and Behaviour at Mcmaster University was designed to investigate the impact of medical terminology on perceptions of disease. Specifically, they looked at the changing public perceptions of newly medicalized disorders with accompanying newly medicalized terms (e.g. impotence has become erectile dysfunction disorder). Their question was: Does using "medicalese" to label a recently medicalized disorder lead to a change in the perception of that condition? Undergraduate students (n = 52) rated either the medical or lay label for recently medicalized disorders (such as erectile dysfunction disorder vs. impotence) and established medical conditions (such as a myocardial infarction vs. heart attack) for their perceived seriousness. Students considered the medical label of the recently medicalized disease to be more serious than the same disease described using common language. A similar pattern was not seen in the established medical conditions, even when controlled for severity. This study demonstrates that the use of medical language in communication can induce bias in perception; a simple switch in terminology results in a disease being perceived as more serious, more likely to be a disease, and more likely to be a rare condition, due to the only information that is available to us when we hear a new medical term: the more complex the term is, we tend to assume that the underlying disease is more serious. "

#### Pen & Paper Lecture Style

This is your typical class demonstration of a concept. Instead of just showing your students data collected and analyzed by other parties, you try to somehow bring that research to class, and personalize the example. What's important to remember about the PP Lecture style is **showing your students their personalized example the following class**.





#### **Availability Heuristic**

A study conducted by researchers within the Department of Psychology, Neuroscience and Behaviour at Mcmaster University was designed to investigate the impact of medical terminology on perceptions of disease. 52 Students rated either the medical or lay label for recently medicalized disorders and established medical <u>conditions</u> for their perceived seriousness. Students considered the medical label of the recently medicalized disease to be more serious than the same disease described using common language. A similar pattern was not seen in the established medical conditions, even when controlled for severity. This study demonstrates that the use of medical language in communication can induce bias in perception due to the only information that is available to us when we hear a new medical term: the more complex the term is, we tend to assume that the underlying disease is more serious.







#### **Briefnotes**

#### Experimental Concept: Availability Heuristic (Approx. 7 minutes)

"Let's look at an example of how the availability heuristic can play a role in our medical perceptions.

On your papers, please rate the following medical conditions, on a scale of 1-10, on their seriousness, 1 being not very serious and 10 being very serious.

(present the slides with the diseases)

(Let the students know that you will be posting their own results on Thursday night, on their AVENUE discussion board. In the meantime, explain the study and show past student data)

A study conducted by researchers within the Department of Psychology, Neuroscience and Behaviour at Mcmaster University was designed to investigate the impact of medical terminology on perceptions of disease. 52 Students rated either the medical or lay label for <u>recently medicalized disorders</u> and <u>established medical conditions</u> for their perceived seriousness. Students considered the medical label of the recently medicalized disease to be more serious than the same disease described using common language. A similar pattern was not seen in the established medical conditions, even when controlled for severity. This study demonstrates that the use of medical language in communication can induce bias in perception due to the only information that is available to us when we hear a new medical term: the more complex the term is, we tend to assume that the underlying disease is more serious.

Present the class past results for each disease, while reading the lay terminology for every term. You will hopefully get some high seriousness ratings for diseases that sound bad, but are not really that grave (such as Seborrheic Dermatitis, which is just dandruff).

--Make sure to draw a parallel between the study results and the class results, in a simple sentence (e.g. "So you can see that your own thinking followed along with the study results that we discussed last week")

#### **iClicker Lecture Style**

These lecture slides and mechanics are very similar to pen and paper teaching condition. However, instead of waiting for next class to show your students their results, you will have to do this on the spot, in tutorial. Instructions can be found in the iclicker (last) section of this booklet.



#### **Availability Heuristic**

- A study conducted by researchers within the Department of Psychology, Neuroscience and Behaviour at Mcmaster University was designed to investigate the impact of medical terminology on perceptions of disease. 52 Students rated either the medical or lay label for recently medicalized disorders and established medical <u>conditions</u> for their perceived seriousness. Students considered the medical label of the recently medicalized disease to be more serious than the same disease described using common language.
- A similar pattern was not seen in the established medical conditions, even when controlled for severity.
- This study demonstrates that the use of medical language in communication can induce bias in perception due to the only information that is available to us when we hear a new medical term: the more complex the term is, we tend to assume that the underlying disease is more serious.

#### **Briefnotes**

Experimental Concept: Availability Heuristic (Approx. 10 minutes)

"Let's look at an example of how the availability heuristic can play a role in our medical perceptions.

With your iclicker, please rate the following medical conditions, on a scale of 1-10, on their seriousness, 1 being not very serious and 10 being very serious. Enter the numbers with your iclickers.

(present the slides with the diseases)

Present the class with their results, while reading the lay terminology for every term. You will hopefully get some high seriousness ratings for diseases that sound bad, but are not really that grave (such as Seborrheic Dermatitis, which is just dandruff). Then present them with the McMaster study.

A study conducted by researchers within the Department of Psychology, Neuroscience and Behaviour at Mcmaster University was designed to investigate the impact of medical terminology on perceptions of disease. 52 Students rated either the medical or lay label for <u>recently medicalized disorders</u> and <u>established medical conditions</u> for their perceived seriousness. Students considered the medical label of the recently medicalized disease to be more serious than the same disease described using common language.

A similar pattern was not seen in the established medical conditions, even when controlled for severity.

--Make sure to draw a parallel between the study results and the class results, in a simple sentence (e.g. "So you can see that your own thinking followed along with the study results")

This study demonstrates that the use of medical language in communication can induce bias in perception due to the only information that is available to us when we hear a new medical term: the more complex the term is, we tend to assume that the underlying disease is more serious.

#### **ICLICKER** Condition: Tech Instructions

First off, in order to dive-in into the magical world of iclickers, you need to know where to retrieve the base unit and the iclickers.

In order to open the cabinets, you need to push the lock upwards in one swift motion and then downwards in the same way. Deanna is still trying to perfect this technique herself, and her advice is to not give up!

Call Irina (x20745) if you have questions/forgot the lock code.

Once you have the iclickers and base unit out, you will need to plug in the base unit, USB, open your tutorial folder and launch iclicker software. Wait, what? I know, written instructions can sometimes fail. Thus, I assembled some picture instructions for you! Excuse the bad computer images. I was working on a PC for this task (since IntroPsych computers are PC), and it didn't have the fancy print screen functions Mac computers do. I had to resume to taking pictures of the actual screen.

If you are the first TA to open up the lock in the morning, these instructions will be very useful. If you do not have the first class of the day, everything will already be connected for you!

First TA of the day: please take out the base unit and iclickers, and assemble everything as instructed below. At the end of the tutorial, just close the iclicker software, but do not unplug the base or the USB.

Last TA of the day: make sure you unplug everything and place the base unit and the iclickers in the cabinet, and lock it.

All other TAs who are teaching the iclicker condition: you will have to launch the iclicker software at the beginning of class, select your tutorial, and "Start Session" (more about this in the pictures below). You can let the software running during your entire tutorial. Close the left-top bar at the end of class, and exit the iclicker software. The next TA will have to select their own tutorial and start a new session.







 This is the base unit

 It contains a base receiver, USB cable and an USB

2. Plug in the square end of the USB into the base receiver

3. The flat USB end... 20







4. Plug into the computer USB port!

5. Your base receiver should light up! One more step to go before you move on to the computer screen...

6. Plug in the USB key at the back of the base receiver



7. You should have a pop up like that. If not, go to "My Computer" and find the removable disk. Open the folder (...and here start the bad quality pictures)



Share with 💌	Burn	New folder	n -
Na	ime	^	Date
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9. Double click on the iclicker Win v6.2.1 folder	

Downloads	iclicker Help	9/13/20
Recent Places	iclicker Libs	9/13/2
	📕 igrader Libs	9/13/2
Libraries	Resources	9/13/2
Documents	SessionData	9/13/2
Music	WebUpdate Libs	9/13/2
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11. Please select your tutorial (the one you are currently teaching)! The data will be saved in separate folders for each "course", so selecting your correct tutorial will help us not mix up the class data!

Choose your courses	ialial
choose your course.	INCIICI
C97	
EC01	
EC07	
EC10	
CTD	
EC16	
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EC16 EC19 EEST	
EC16 EC19 tEST New Edit Delete	(') = web>clicker enabled

12. I selected the "tEST" course to walk you through the rest of the steps. Highlight it by clicking it, then click "choose"



# 13. You are almost there! Click on start session.



14. You will see this tiny iclicker bar in the upper-left corner of your screen. You can switch what kind of answers you are accepting, between A-E (multiple choice) and numeric (if the tutorial exercise required students to enter numbers)



15. Change the polling to Numeric, since the if you will be asking students to enter numbers (their height for research methods). Change it back to multiple choice if you have to ask a MC question, otherwise, the students won't be able to submit responses.

Click on the green > button to start polling



#### 16. Once you start polling, you will see the STOP polling button, as well as time elapsed and number of entries. Stop polling when you see that all students entered their responses.





17. Students will be using iclicker 2's for this class. Power button is orange, refresh screen is blue. To enter numbers, click < and > to go back to a number or advance to the right, and up and down to select either a number or character (such as "." for heights in feet [5.6]). <u>There</u> <u>are iclicker user pamphlets</u> in each tutorial room <u>iclicker box</u>. Click 'send' to submit numeric answers.

18. Click on the histogram button to show responses



19. Click on the button that looks like the pie chart and select "Histrogram". You will be able to see a pattern in distribution.



Results Chart Question 1 0 votes not displayed 2 (25%) 2 (25%) 1 (12%) 1 (12%) 1 (12%) 1 (12%) 0 (0%) 0 (0%) 100 No<sup>2</sup> ,*6*9 100 164 <sub>ر</sub>هه 22 <u>م</u>م ્ર્જ  20. Here is a sample of data I collected with 8 iclickers. You can change the number of units on the x-axis. So intead of distributing the numbers into 6 increment (like my example, you can choose 8, 9, 10..etc.) Choose one that will make your class data look more like a normal distribution





22. Here is where you can select how many increments you want for your data. The default setting is 5. Go through them and choose one that makes your class distribution look similar to a normal or bimodal distribution.



23. Close the iclicker bar by clicking 'x'

24. Close this window, as well as any other window associated with opening the software. You may leave the USB folder window open, for the next TA to click iclicker.exe and restart the software.

If you have any questions, please post the on AVENUE, in the appropriate folder, or email ghilicai@mcmaster.ca

## **Appendix 2: Quiz Questions**

Concept 1: Normal Distribution, Quiz 2 (not used for data analysis)

Question: Talysha is shopping for new shoes and notices that there tends to be a larger number of shoes in size 7, indicating that they are in higher demand. There are less size 9s and 5s, and very few shoes larger than 10 or smaller than 4. If Talysha plotted her observations and found a normal distribution, what can we determine about size of women's shoes?

- a. The standard deviation of this distribution is 3 shoe sizes.
- b. The mode or average shoe size for women is 7.
- c. There are fewer women with size 8 than size 5 shoes.
- d. There is a bimodal distribution, with 6 and 8 being the peaks.

Concept 2: Categories and Concepts, Quiz 7

Question: According to the web module and work done by Dr. Lee Brooks, which of the following statements is most correct?

- a. The illusion of the expert refers to our ability to assign rules to complex categories with relative ease.
- b. There is a positive correlation between category complexity and percentage of people able to develop a category rule.
- c. Our internal representations of objects rely on our ability to assign rules to complex categories with relative ease.
- d. Our ability to assign rules to simple categories often leads us to believe that rule creation is a simple process.

Concept 3: Forming Impressions, Quiz 11 (not used - poor average for correct option)

Question: Researchers investigating different diseases are trying to convince the public to donate to their respective cause. Which of the following will people likely find most severe, encouraging them to donate to that cause?

- a .Lou Gherig's Disease, a common term that many people will likely have previously heard.
- b. Cerebrovascular Accident, a little known medical term for 'Stroke' which is an established medical condition.
- c. Male Pattern Baldness, the plain terminology for a recently established condition.
- d. Gluten-Induced Enteropathy, a medical term for 'Celiac Disease' which is commonly known as being a serious condition.

## **Appendix 3: Exam Questions**

Concept 1: Normal Distribution (not used for data analysis)

Questions: This year's census in Maydupland found that the average family size consisted of 5 individuals. Data from past years suggest that the population size and spread of family size data about the mean is always the same. Family size always follows the normal distribution. Based on the information in this question, which of the following statements is most correct?

- a) Although the mean family size is 5, the most frequently occurring family size might have been different.
- b) Compared to this year's census, the maximal peak of the distribution will be smaller in a year in which mean family size is 4.
- c) According to this year's census, more families consist of 6 individuals than of 3 individuals.
- d) It is likely that a graph of family size distribution will be a smooth, asymmetrical, bell-shaped curve.

**Concept 2: Categories and Concepts** 

Questions: David is asked to develop a simple rule that can be used to categorize fruits and exclude vegetables and nuts. David immediately realizes this will not be an easy task and, sure enough, finds he is unable to do so. He can, however, correctly identify an object of each category when shown an individual image. According to this information, which of the following statements is correct?

- a. David's inability to develop a simple rule for fruit membership suggests that he is subject to the illusion of the expert.
- b. According to Lee Brooks, most people would find it easy to develop a simple rule for a complex category like fruit.
- c. <u>David's behaviour suggests the existence of internal representations of categories that exist</u> independent of rules for membership.
- d. When images of fruits and vegetables are viewed simultaneously, David will be unable to distinguish fruits from vegetables.

#### **Concept 3: Forming Impressions**

Question: A manager is desperate to attract higher caliber candidates to his organization. He adjusts old job titles to advertise four newly listed positions. If we assume that the candidates use the **availability heuristic**, which of the following newly listed positions is most likely to increase interest in applying?

- a) John would be more likely to apply for the listed position "Investment Analyst" which evokes no clear associated views, knowing the job's old title is actually "Financial Analyst", which evokes several positive associated views.
- b) Beth would be more likely to apply for the **listed** position "Debt Management Officer" which evokes no clear associated views, **not knowing** the old job's title is actually "Tax Collector", which evokes several negative associated views.

- c) Sue would be more likely to apply for the **listed** position "Tour Guide" which evokes several negative associated views, **knowing** the old job's title is actually "Coordinator of Interpretive Teaching", which evokes no clear associated views.
- d) Tom would be more likely to apply for the **listed** position of "Garbage Collector" which evokes several negative associated views, **not knowing** the old job's old title is "Waste Management Technician", which evokes several positive associated views.

## **Appendix 4: Qualitative Questionnaire**

1. Please rate the helpfulness of Pen&Paper in comprehension of 1X03 course concepts:

- 1 Not very helpful
- 2 Somewhat unhelpful
- 3 Neutral
- 4 Somewhat helpful
- 5 Very helpful

2. Please rate the helpfulness of iclickers in comprehension of 1X03 course concepts:

- 1 Not very helpful
- 2 Somewhat unhelpful
- 3 Neutral
- 4 Somewhat helpful
- 5 Very helpful

3. Please indicate which tutorial module used iclickers in demonstrating a course concept:

Research methods Categories & Concepts Forming Impressions Cannot recall, but I did use iclickers in one of my tutorials Did not use iclickers in any of my 1X03 tutorials

4. Based on your 1X03 experience, would you advocate the use of iclickers in demonstrating course concepts?

- 1 Not very likely
- 2 Somewhat unlikely
- 3 Neutral
- 4 Somewhat likely
- 5 Very likely