

**Using Handheld Dials to Measure Response to Scientific Information on Podcasts**

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### Introduction/ Need for Innovation

Measuring message effectiveness is a pillar of the agricultural communications discipline. Understanding how messages are perceived, and particularly if they have the intended impact (i.e., education, persuasion, action), can assure strategic communicators they are on the right track or prompt redirection. We often rely on surveys, interviews, and focus groups to measure how audience members react to a stimulus, sometimes experimenting with multiple versions. These tools require participants to rely on memory and recollection, which have been shown to be less than ideal regarding reliability (Wynn & Moscovitch, 2020). While memory research is still developing, it is understood that memory is flawed and becomes less reliable the more time has passed (Ryan & Cohen, 2003). Furthermore, these tools allow for post-hoc rationalization, or the opportunity to situate the message internally among other perceptions.

Continuous response measurement (CRM) captures how people interpret dynamic stimuli (e.g., video, audio, live presentations) in a moment-to-moment reaction, in this case through handheld dials. Participants view or listen to a dynamic stimulus and turn their dials right to indicate a positive reaction and left to indicate a negative reaction throughout the duration of the stimulus. This negates memory biases and allows us to measure gut reactions to specific points in the stimulus. By measuring responses to these specific message points (e.g., a scientific fact or introduction of a novel technology), we can understand reactions to these specific bits of information/presentation, unlike surveys that typically capture reactions to the entire package (Biocca et al., 2014). While the *Journal of Agricultural Education* has hosted psychographic moment-to-moment analyses through heart rate and skin conductance measurements (Fischer et al., 2018; Gilliam et al., 2018), it has yet to include a dial testing study. The *Journal of Applied Communication* has seen an increase in dial testing studies in recent years (LaGrande et al., 2021; Lawson et al., 2020; Lim & Swenson, 2021; Tarpley et al., 2020) but have yet to measure response to podcasts. Extension research has also included dial testing efforts to measure audience response to educational videos (Cummins et al., 2018). Dial testing broaches many, if not all, priorities in the AAAE National Research Agenda, as each priority involves strategic messaging efforts that could benefit from pre-distribution testing. This abstract introduces a novel use of dial testing to measure response to podcasts discussing genetically modified foods and COVID-19 and explores uses for dial testing in agricultural education and communications.

### How it Works

In this section, we will describe how to conduct a dial testing study and use an example of a study testing podcasts. Establishing a dial testing study involves choosing the stimulus, choosing response options, and collecting data through the Perception Analyzer technology (Lawson et al., 2020). First, the researcher should decide which stimulus (e.g., video, presentation, podcast) to use and how to design the study (e.g., experiment, pre/post surveys). The stimuli could be a pre-made, such as a video from an organization's website, or created for the study as we created the podcasts. The next step is to choose which response options will provide the desired insight. Our study asked, "how much do you agree with the content presented?" (0 = *do not agree at all* to 100 = *completely agree*). When the desired stimulus has been chosen, it should be uploaded into

the Perception Analyzer technology, which facilitates data collection through a suite of wireless handheld dials connected to a computer and projector that displays instructions, the prompt and response options, and stimuli. In our example, participants took a Qualtrics pre-test via QR code on each desk followed by three practice questions to allow the participants to gain familiarity using dials. After, the participants continuously reported their trust throughout the first and second podcast. After each podcast, the participants completed post-tests providing overarching reactions to the podcasts.

### **Results to Date, Implications, & Future Plans**

As podcasts have emerged as a popular source of scientific information for college students and other populations, we used CRM to measure the reaction of over 100 college students to popular bits of scientific information and misinformation around genetically modified food and the COVID-19 vaccine. We experimented between four messages, two on each topic, with one having scientific sources and the other not. We have been able to dissect how responses vary based on topic, source (ex. CDC, USDA, “a friend”), and audience characteristics. Using CRM for podcasts is a novel approach that allows participants to simply rate their perception of the information itself while not being distracted by visual components. Podcasts also have increased ecological validity because many people enjoy listening to them and are familiar with the format (i.e., two people having a casual dialogue). For this reason, podcasts could be used to measure perceptions of other complex topics in agricultural education and communication and were relatively easy to record. CRM in general has the potential to make a great impact in each agricultural social science discipline. For educators, it could be used to gauge student response to lectures or educational videos. Extension agents can test videos and in-person lectures on complex topics like sustainable agricultural practices and climate change. As communicators, we plan to continue to measure perceptions of other complex scientific topics like climate change and regenerative agricultural practices through experimental message testing.

### **Advice to Others**

Researchers should include a few practice questions to get participants comfortable using the dials. Adequate time should be allotted for uploading the study, training researchers, and rehearsing with a pilot group. A moderator’s guide (i.e., a script to introduce the study and provide instruction throughout) should be used to facilitate each session so participants receive the same detailed instructions. However, the moderator should be prepared to offer context-specific suggestions like, “Don’t forget to rest the dial at 50 to show neutrality,” or “Keep the dials in hand!” Surveys should include a spot for the dial number so the dial data can sync with participants survey data. Furthermore, taking detailed notes of malfunctioning dials, inattentive participants, and other laboratory situations can aid in the data analysis process.

### **Costs/ Resources Needed**

The Perception Analyzer technology can be quite costly, although grants and other funding opportunities exist. Our system, consisting of 22 dials, one console, one software license, and one hard-sided rolling case, cost \$16,745. As Lawson et al. (2020) suggested, collaboration between departments and colleges can share the cost of this technology. Other resources needed include undergraduate or graduate researchers, proper training, and participants.

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