



# GETTING TO THE HEART AND MIND OF THE MATTER:

A Toolkit to Build Confidence as a Trusted Messenger of  
Health Information

Edition 4 – March 2024



**WASHINGTON STATE**  
UNIVERSITY



**EXCITE**  
Extension Collaborative on  
Immunization Teaching & Engagement

## Attribution

*Getting to the Heart and Mind of the Matter: A Toolkit to Build Confidence as a Trusted Messenger of Health Information*

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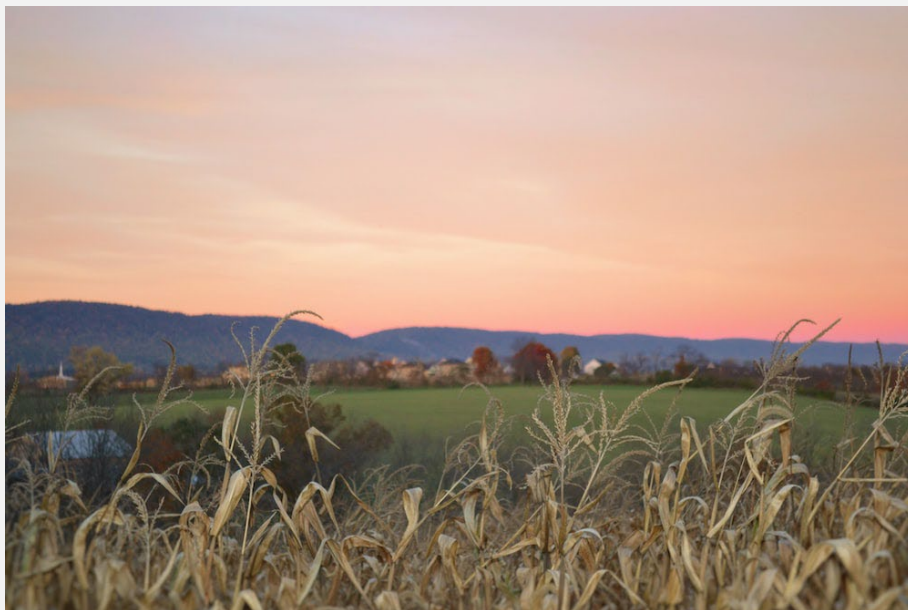
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## Executive Summary

The purpose of this workbook is to better equip and empower all Extension professionals to participate as active agents in vaccine education and any other health education initiatives in their communities. The toolkit, and accompanying workshops materials, were created to help professionals learn and enhance communication skills, with an emphasis on HOW to communicate with audiences rather than what to communicate. This research-based, theory-informed, multidisciplinary approach combines the influence of emotions and reason on behavior change communication.



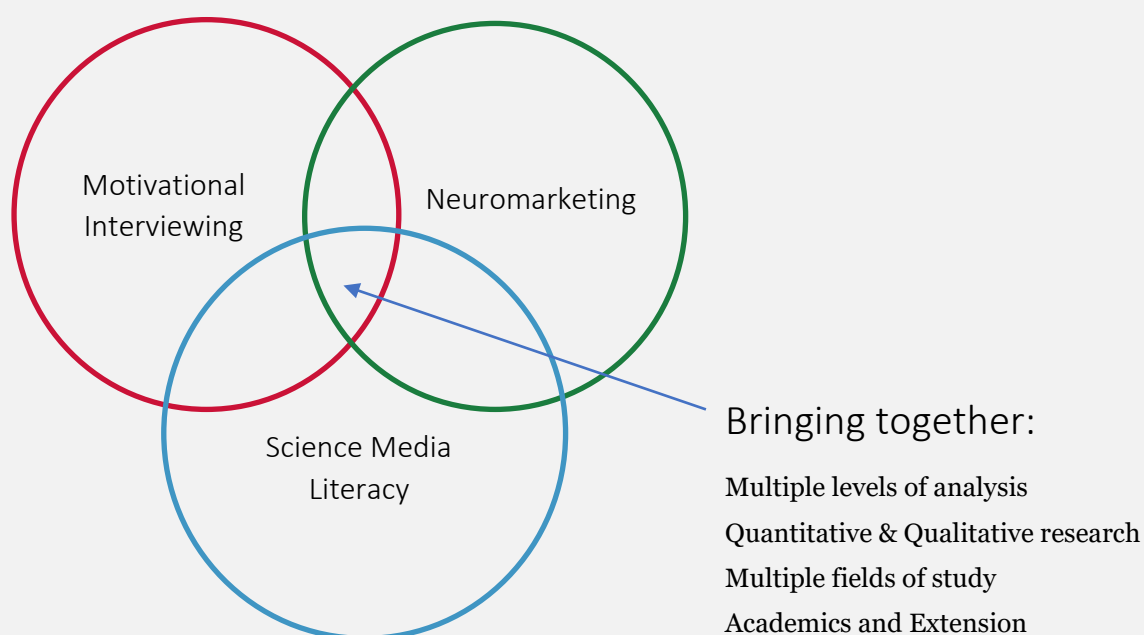
# INTRODUCTION

## Introduction

Welcome to *Getting to the Heart and Mind of the Matter: A Toolkit and Workshops for Building Confidence in Being a Trusted Messenger of Health Information*. In preparation of this e-field book, the Washington State University's EXCITE team conducted a needs assessment to enhance resource development and evaluation for providing Extension professionals with resources to equip and empower them to implement vaccine education in their communities. The assessment, which involved a mixed-methods survey and follow-up focus groups, identified four key needs: tailoring trainings based on Extension roles, prioritizing preserving community trust and professional credibility, establishing connections with medical experts, and strengthening science media literacy skills to counter misinformation and communicate emerging science. The needs assessment findings informed the current toolkit by addressing the unique needs of Extension professionals and offering evidence-based strategies for promoting vaccine education while maintaining trust and credibility within the community.

Our approach combines the influence of emotions and reason on behavior change communication.

**Figure 1: Integration of Motivational Interviewing, Science Media Literacy, and Neuromarketing**





The content and resources reflect the three-prong approach to this work. The first chapter on *Motivational Interviewing (MI)* discusses the foundation of how we communicate with individuals and groups to make them feel understood, confident, and in control to make good decisions. The second chapter on *Science Media Literacy (SML)* focuses on how our SML confidence and skills help ensure we can access, analyze, evaluate, create, and act using media in a variety of forms. The third chapter is about *Neuromarketing (NM)* where we reflect on the human mind and how to apply brain friendly messaging to develop vaccine education content. Finally, our conclusion addresses the synergy created when using this three-prong approach by sharing visuals and applied tools, resources, and strategies for integrating MI, SML and NM based communication strategies and measuring success. The pandemic inspired this vaccine focused content, but the information is applicable to all health education initiatives beyond adult vaccination. This tool kit and the accompanying materials are an opportunity to learn and enhance your communication skills, with an emphasis on HOW to communicate with your audience rather than WHAT to communicate with them.

## Effective Vaccine Communication

### Resource Box:

Peer Reviewed  
Journal Article

**Effective Messages in Vaccine Promotion: A Randomized Trial**

<https://doi.org/10.1542/peds.2013-2365>

Which of these approaches do you predict are effective for addressing vaccine hesitancy?

- Correcting misinformation
- Presenting information on disease risks
- Using dramatic narratives (stories)
- Using images of individuals with the disease to make those risks more relevant

Nyhan et al (2014) discovered these approaches may further confuse the issue or increase resistance to vaccinations. Here is a summary of what they found when they showed [these different types of vaccine education materials](#) to parents:

- Correcting misinformation about the link between MMR and autism successfully reduced misperceptions ***BUT decreased intent to vaccinate among parents most resistant to vaccinate.***
- On average, simply providing information about disease risks ***didn't improve either attitudes or intentions for vaccinations.***
- An emotional story about an infant in danger ***increased belief in serious vaccine side effects.***
- Showing images of children with visible symptoms of measles, mumps, and rubella ***increased belief in the link between autism and the MMR vaccine.***

Take Aways:

- Trying to change vaccine hesitancy by simply providing facts may backfire and increase resistance.
- Current public health communications about vaccines may not only be ineffective but may increase misperceptions and reduce vaccination intention.

**Table 1: Making the Truth Stick**



5 Minute  
Read

Another typical approach for addressing misinformation is to use a “Myth versus Facts” format. But due to how our brain works, this can increase the salience and spread misinformation!

[Website Link:](#)

**The impact of mythbusting sites**

What you see:                      What you might remember:

<p><b>THE DAILY MYTHBUSTER</b> Home Topics Coronavirus Subscribe Donate</p> <p><b>MYTH:</b> "The moon is made of green cheese."</p> <p><b>FACT:</b> The Moon formed 4.51 billion years ago, some 60 million years after the origin of the Solar System. Several forming mechanisms have been proposed, including the fission of the Moon from Earth's crust through centrifugal force (which would require too great an initial spin of Earth), the gravitational capture of a pre-formed Moon (which would require an unfeasibly extended atmosphere of Earth to dissipate the energy of the passing Moon), and the co-formation of Earth and the Moon together in the primordial accretion disk (which does not explain the depletion of metals in</p>	<p><b>THE DAILY MYTHBUSTER</b> Home Topics Coronavirus Subscribe Donate</p> <p><b>MYTH:</b> The moon is made of green cheese.</p> <p><b>FACT:</b> The Moon formed 4.51 billion years ago, some 60 million years after the origin of the Solar System. Several forming mechanisms have been proposed, including the fission of the Moon from Earth's crust through</p>
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The Conversation, CC BY-ND

## Moving Beyond Facts

***“Given that emotions are found to influence vaccine risk perceptions and intentions more strongly than statistical information, vaccine education efforts must move beyond presenting factual information to address emotions surrounding COVID-19 .”***

*-Chou & Budenz, 2020*

According to Chou & Budenz (2020), leveraging and balancing positive and negative emotions are essential for significantly addressing vaccine hesitancy and increasing vaccine confidence.

They recommend three specific strategies, which align with the three communications strategies of Motivational Interviewing, Science Media Literacy, and Neuromarketing.

**Table 2. Three Strategies for Leveraging and Balancing Emotions**

	Chou & Budenz Recommendations	Examples
1.	Acknowledge fear, anger, and other negative emotions while supporting self-efficacy.	Motivational Interviewing: Use Reflections and Affirmations to validate emotions; provide new information with Ask-Offer-Ask to support autonomy.
2.	Raise awareness of how anti-vaccine groups use negative emotional appeals to amplify fear and anger.	Science Media Literacy: Recognize how groups spreading misinformation and disinformation are manipulating emotions. Develop skills to manage emotions to work with rather than against self-interests when evaluating science media.
3.	Counteract negative emotions and activate positive emotions.	Neuromarketing: Tailor vaccine education content to activate but not overwhelm with negative emotions. Use narrative and images promoting community-

		<p>focused, pro-social values that elicit positive emotions.</p> <p>Motivational Interviewing: highlight feelings of control by emphasizing choice, providing accurate &amp; trusted information and connect vaccine decision to values.</p>
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Resource Box:

<p>Peer Reviewed Journal Article</p>	<p><b>Considering Emotion in COVID-19 Vaccine Communications: Addressing Vaccine Hesitancy and Fostering Vaccine Confidence.</b></p> <p><a href="#"><u>Article Link</u></a></p>
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# MOTIVATIONAL INTERVIEWING

Chapter 1

## Motivational Interviewing

What is Motivational Interviewing? Why Motivational Interviewing for Vaccine Education?

Motivational interviewing (MI) was developed by Drs. Miller and Rollnick to help people change their substance use and health behaviors. MI is defined as:

...is a specific form of interviewing. When practicing MI, the interviewer has a guiding role .... The recipient of MI is being served and ultimately is the one who decides what to change, if anything. MI is not about *installing* motivation in people, but rather *evoking* it from them. (p.15, [Miller & Rollnick, 2023](#)).

### ***Why Motivational Interviewing for Vaccine Education?***

MI is an evidence-based strategy to engage people in conversations about changes in health behaviors ([Rollnick et al., 2023](#)). It is effective in supporting a variety of health behaviors such as medication adherence ([Palacio et al., 2016](#)) and smoking cessation ([Lindson-Hawley et al., 2015](#)), and has recently been identified as an effective strategy to decrease vaccine hesitancy (e.g., [Bidkhanian, 2023](#); [Cogordan et al., 2023](#)).

When utilized by Extension Professionals it provides the avenue for:

- Communicating confidently with anyone about adult vaccines.
- Avoiding unpleasant confrontations while maintaining trust and credibility.
- Creating the environment for people to express concerns and questions



## The Guiding Spirit of Motivational Interviewing

Motivational interviewing is founded upon the following principles, also known as the Spirit of MI ([Miller & Rollnick, 2023](#)):

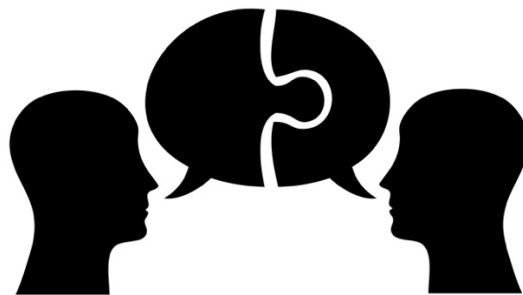
**Partnership:** Invite people to share their expertise on their own lives and experiences. Ask permission to share your expertise about vaccines and check-in about how the information that you share fits with people's values and goals.

**Acceptance:** Accept people where they are and do not try to persuade or change them. Support people's autonomy to make choices about their lives, affirm their strengths and values, and demonstrate empathy.

**Compassion:** Communicate to people that we hold their autonomy and well-being as the highest priority.

**Empowerment:** Supporting autonomy with the focus of evoking individual's strengths, resources, and skills to engage in goal behavior.

An easy way to remember the Guiding Spirit of MI is to think of the acronym **PACE**. We **PACE** our conversations with others: we partner with and accept them from a compassionate and evocative stance.



The Guiding Spirit of MI helps prevent or decrease *discord* (Miller & Rollnick, 2023). *Discord* arises when people do not feel heard or understood. It can look like a power struggle, irritation, anger, or giving one-word answers or not answering at all. To decrease *discord*, you can (1) support their autonomy, (2) change the topic of the conversation, and/or (3) apologize.

Below you will find an example of two conversations: typical conversation and MI-informed conversation. As you watch this video, consider how MI-informed conversation differs from the typical conversation.

***Video Resource Box: A Taste of Motivational Interviewing***



## A Taste of MI

- You will observe two interactions between me and one of my colleagues
- Please, note what is effective about each interaction and what is less effective.



## Motivational Interviewing and Self-Determination Theory

MI Spirit aligns with the principles of Self-Determination Theory (SDT; [Ryan & Deci, 2017](#)). In SDT, intrinsic motivation is supported by *autonomy*, *competence*, and *relatedness*. In MI, intrinsic motivation is supported by Partnership, Acceptance, Compassion, and Empowerment. Through Partnership and Compassion, we strengthen our *relationships* with people. Through Acceptance and Empowerment, we strengthen people's sense of *autonomy and competence*. In sum, SDT provides a theoretical foundation for supporting intrinsic motivation and MI provides concrete strategies for doing so ([Miller & Rollnick, 2012](#)).

For more information on Self-Determination Theory, [click on this link](#) to watch Dr. Richard Ryan describe the use of SDT in healthcare.

## Four Tasks of Motivational Interviewing

Motivational interviewing has four tasks that can be used as a roadmap for MI practitioners ([Miller & Rollnick, 2023](#)):



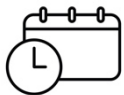
**Engage:** Before having a conversation about change, you need to build sufficient engagement. During *engaging* you demonstrate empathy about the other person and who they are. *Tip:* Ask the person about their successes, strengths, or values. Affirm their life experiences. Listen well.



**Focus:** Once you have sufficient engagement, you can start to focus on the conversation. Collaboratively with the person, you identify the focus of the conversation. Having a focus will help you move the conversation toward the direction of change. *Tip:* Provide the person with a menu of options or a list of potential topics that you could talk about. Invite them to choose one of the topics or identify a different topic.



**Evoke:** Having a focus helps you evoke the person's own arguments for change (also known as *change talk*). The higher the frequency of these statements, the higher is the likelihood that the person will engage in change. You will find more information about *change talk* in the next section of the Toolkit. *Tip:* Explore with the person how *important* it is for them to consider receiving a vaccination and what would need to happen for it to become a little more important. Explore with the person how *confident* they feel about getting a vaccination and what could help them feel a little more confident.



**Plan:** The planning process invites the person to develop a formal or informal plan of next steps towards a new behavior. *Tip:* Invite the person to summarize why this change is important to them, the next steps that they are willing to take towards that change, and who could support them during this change. Evoke hope and confidence.

## Change Talk: Statements about Change

Change talk is at the heart of motivational interviewing and refers to the person's own arguments for change ([Miller & Rollnick, 2003](#)). An increase in the frequency of change talk is related to behavior change ([Magill et al., 2018](#)). Below you will find the seven categories of change talk. You do not have to memorize these categories; however, having some familiarity with them might help you notice change talk in your conversations.

- **Desire:** I want to change.
- **Ability:** I can change.
- **Reasons:** These are my reasons for changing.
- **Need:** I need to change
- **Commitment:** I will start engaging in the new behavior
- **Activation:** I am considering change.
- **Taking Steps:** I will start/have started to take these steps towards change.

The acronym for change talk is DARN CATS



Now, it's your turn to practice recognizing change talk! Find Table 3 below. Read each statement in the first column. In the second column, write-in what change talk category this statement falls under (desire, ability, reasons, need, commitment, activation, taking steps).

**Table 3: Change Talk Exercise**

Statement	Change Talk Category?
Example: I'd like to find out more information about vaccine safety.	Desire
I am a little afraid that if I don't get the vaccine, I might get sick and not get better.	
I must take care of my family and can't afford to take sick time off.	
I have nothing against medicine. I go to the doctor when I need to.	
I scheduled an appointment at the pharmacy to get my vaccine.	

## MI and Vaccine Hesitancy

In the next pages, we will explore key MI skills that help us demonstrate *the Guiding Spirit of MI*, move through the *Tasks of MI*, and evoke and reinforce *Change Talk*. This section will provide information to help you understand MI concepts and provide strategies for how to put each concept into practice. Whether you are brand new to MI or have explored these skills in the past, this section gives you the opportunity to apply MI skills to audiences experiencing vaccine hesitancy.

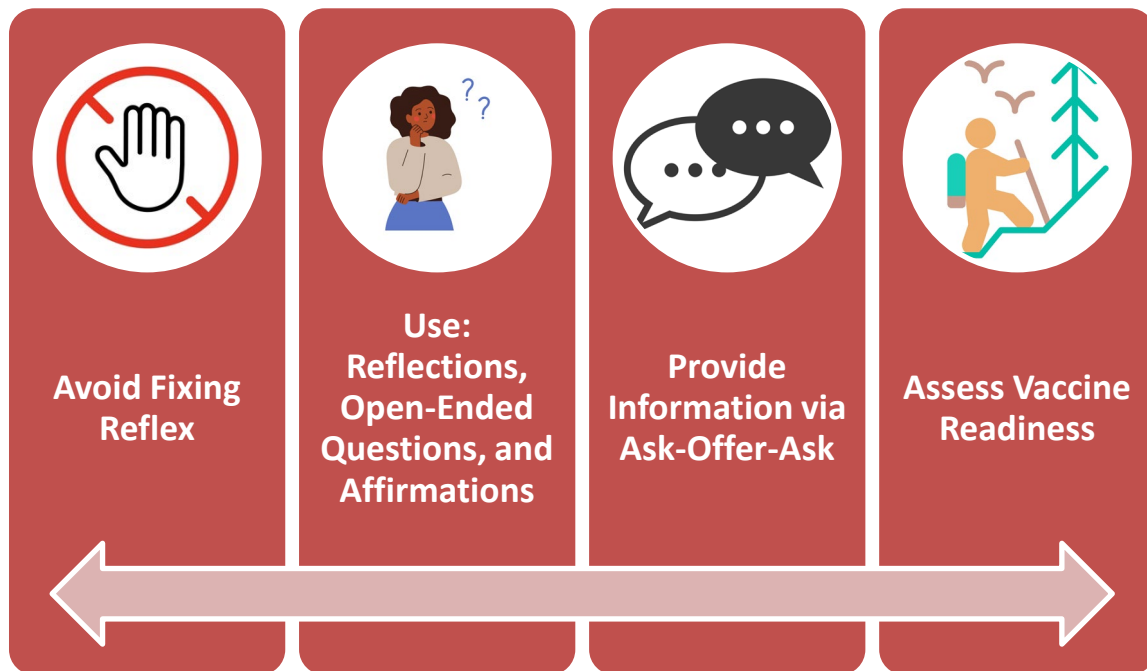
First, what is vaccine hesitancy? [Dr. Larson and colleagues \(2022\)](#) define vaccine hesitancy as:

... a state of indecision and uncertainty that precedes a decision to become (or not become) vaccinated. Vaccine hesitancy is an attitude or sentiment, whereas vaccination is an action, which is measured to determine vaccine coverage. The period of hesitancy and indecision is a time of vulnerability, as well as opportunity. Sentiments concerning whether to undergo vaccination can change, and change again, as evidenced in multiple surveys showing that Covid-19 vaccine sentiments are influenced by factors such as a new report of vaccine risks or perceptions of increasing or decreasing disease threats (p. 58).

In other words, vaccine hesitancy is an ongoing state where readiness and willingness to get

vaccinated fluctuates. Most importantly, it is a time of “vulnerability, as well as opportunity” ([Larson et al., 2022, p. 58](#)). Motivational interviewing is a guiding approach that offers support and focuses on increasing intrinsic motivation to move towards reducing vaccine hesitancy in the direction of getting vaccinated.

Figure 2. Key Motivational Interviewing Technical Skills for Vaccine Hesitancy



**Note:** Is it important to emphasize that these motivational interviewing skills are not always utilized in a linear process. Based on the conversation, you might utilize any one of the motivational interviewing skills in any order.

Additionally, these skills do not cover the entire array of Motivational Interviewing skills or concepts. We tailored the information provided in the Toolkit to be focused on the most essential elements of Motivational Interviewing likely to be relevant to Extension professionals engaged in individual or group vaccine education or community outreach.

## ***Avoid Fixing Reflex***

The “fixing reflex” is our urge to correct misinformation or tell people what to do when we have important information. The “fixing reflex” makes it difficult to build an effective working relationship and can shut down a conversation ([Miller & Rollnick, 2023](#)). It is easy to fall into the trap of fixing reflex when addressing vaccine hesitancy. Our intention is to provide accurate information and to try and convince others to act in the best interest of their health. However, this approach often backfires.

Refer to the video example above. What did you notice about how fixing reflex impacted Alexandra’s engagement? Think about a time when you used fixing reflex in a conversation. Record your thoughts about the conversation: What happened during and after the conversation? How did you feel about the conversation? How do you think the other person felt?

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So, what can we do instead of trying to fix? First, we need to engage and establish a positive relationship with the other person.

- Listen
- Rely on Partnership, Acceptance, Compassion, and Empowerment of the Guiding MI Spirit
- Seek to understand the other person’s perspective and suspend judgement
- Acknowledge that the person is the expert on their life and that do not have control over what they choose to do
- Emphasize that the person is working towards having a good life, as they define it

What situations will be most difficult for you to resist the fixing reflex? What will you do to prepare yourself ahead of time or adjust during the conversation?

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## **Reflections**

Reflections are statements that communicate “I hear you and I want to understand you.” Reflections, as the name suggests, reflect back to the person what they just said. Sometimes you may want to reflect exactly what that person said (*simple* reflection). Sometimes, reflecting the underlying meaning or feeling of the person’s statement might be more impactful (*complex* reflection). Using accurate reflections can build a strong working relationship and help you evoke and reinforce change talk ([Miller & Rollnick, 2023](#)). Here are some tips for using reflections:

- Respond to underlying meaning and feeling
- Respond to change talk
- Note all cues, including non-verbal clues

Reflections can be *simple* (restating what the person said) or *complex* (reflecting the underlying meaning or feeling of what the person said) (Miller & Rollnick, 2023). See two scenarios below for an illustration of simple and complex reflections.

### **Scenario 1**

#### **Extension Partner:**

*“I don’t see why Extension is doing vaccine education. That is work for the health department.”*

#### **Simple reflection:**

*“You don’t think Extension should be doing vaccine education.”*

What other ideas do you have for a simple reflection for this statement?

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## Scenario 2

### Extension Professional:

*“I wouldn’t touch vaccine education with a ten-foot pole! It is so controversial and political. Besides, it is a personal decision, and you can’t change people’s minds.”*

### Complex Reflection:

*“You want some evidence that vaccine education is effective and can support people’s individual health choices.”*

What other ideas do you have for a complex reflection for this statement?

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### Open-ended questions

Open-ended questions help you move the conversation forward. They are questions that prompt more than just a yes or no response ([Miller & Rollnick, 2023](#)). Open-ended questions often begin with the words *How, What, When, and Tell me more about that*. A fun fact – sometimes open-ended questions can sound like a statement rather than a question.

Examples:

- Tell me more about that.
- What do you like/dislike about that?
- What is your biggest concern?
- What might be the best outcome of this decision?
- How might this impact your life?
- How could you find out more information?
- Tell me about the time when you had to make a big decision.
- 

Here is an example of using open-ended questions in a conversation:

Community Member: *“Well, don’t take that personally, but yes to be honest. At least you are listening to me and trying to understand how we feel in this community.”*

Extension Professional: *“What will help you feel more comfortable about this?”* (Open-ended question)

Take a few moments to make the statements below into open-ended questions:

Do you have any questions about adult vaccines?

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Do you have any concerns about getting the COVID booster or another vaccine?

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### ***Affirmations***

Affirmations reflect a person’s value, strength, effort, or skill and help build confidence ([Miller & Rollnick, 2023](#)).

In the exercise below, you have an opportunity to practice providing affirmations.

Extension Partner *“Extension shouldn’t be promoting vaccines and telling people they should get them.”*

Example of an affirmation: *“Making sure people have a choice about vaccines is important to you.”*

What other value, strength, effort, or skills can you get from this statement and provide as an affirmation?

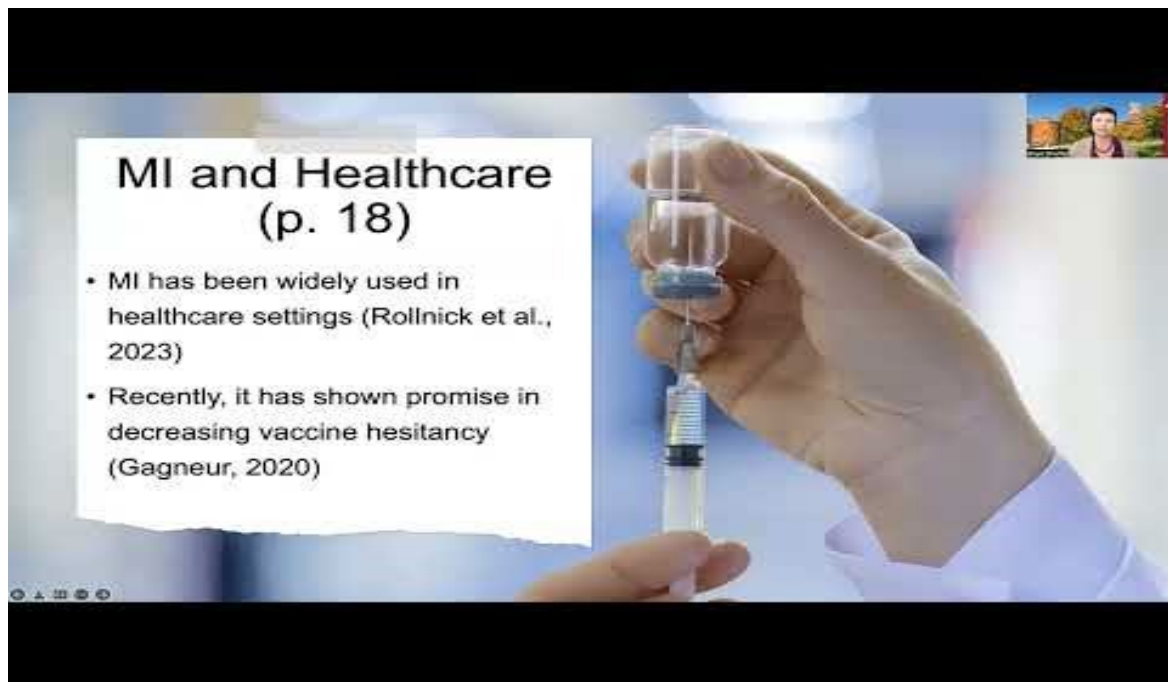
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The video on the next page provides a summary of MI and the skills described above:

## ***Video Resource Box: Overview of Motivational Interviewing***



Let's come back to vaccine hesitancy. With the wealth of credible information, why would people not want to get vaccinated? The answer to this question is complex. A systematic literature review conducted by [Kumar and colleagues \(2022\)](#) focused on identifying key factors in Covid-19 and influenza vaccines across several countries. They identified the following four themes:

- Concerns about vaccine safety
- Lack of trust in the government, the pharmaceutical companies, healthcare policies, and published studies; lack of knowledge about types of available vaccines and their safety
- Lack of perceived need for vaccination due to low concern about getting ill and viewing vaccines as ineffective, and relying on higher power for protection
- Cultural reasons

While this is not an exhaustive list, we can see that the reasons for vaccine hesitancy are personal and that it may be challenging to alter these beliefs by information sharing alone.

Read through the following hypothetical statements and follow prompts to develop an MI-consistent response.

Community Member: *“My daughter posted on X an article that says that the flu vaccine is unsafe. I hardly ever get sick. Why should I risk it?”*

Your response (**prompt**: use a complex reflection to highlight the underlying meaning):

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Community Member: *“Yeah. I just don’t trust the government. They have their own agenda and really don’t care that much about my health.”*

Your response (**prompt 1**: identify change talk; **prompt 2**: use a complex reflection to reinforce this change talk):

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Community Member: *“My health is important to me. I grew up in the church and I believe that God will protect me and if it’s my time to go, there is nothing I can about that.”*

Your response (**prompt 1**: use a simple reflection to respond):

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Community Member: *“So, what am I supposed to do and who am I supposed to trust?”*

Your response (**prompt 1**: go through previous statement from the community member and identify change talk that is present; **prompt 2**: summarize that change talk in a form of a statement; **prompt 3**: end with an open ended question aimed at guiding the community member towards finding out more information about vaccines):

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Well done on completing this part. Let’s talk about other MI skills to address vaccine hesitancy.

## ***Ask-Offer-Ask for Providing Information***

Ask-Offer-Ask is a strategy to share information in an MI-consistent way ([Miller & Rollnick, 2023](#)). There are several steps to using this strategy effectively.

**Step 1: ASK:** “What do you know about \_\_\_\_\_?”

This step supports the person’s autonomy and competence. Additionally, it elicits what information they already know so you don’t have to repeat it. After the person shares what they know with you, *affirm* them for their knowledge. Consider using a reflection to highlight any change talk that they might share. See an example of Asking below:

Extension Professional: “*What do you know about vaccine safety?*”

Community Partner: “*Well, I know that some of them are safe. But some, I am not sure about.*”

Extension Professional: “*You’ve done your homework (affirmation). And if you had more information about some of the other vaccines, that’d help you make up your mind about them (reflection).*”

Community Partner: “*Yeah, that sounds about right.*”

Extension Professional: “*Would it be ok if I share some information about these vaccines? (asking permission)*” Note: asking permission supports the person’s autonomy to decline. If they decline, you do not move to Step 2. If they agree, then go to Step 2.

Community Partner: “*Sure.*”

**Step 2: OFFER:** [Share 1 piece of information].

**Step 3: ASK:** “*What do you think about what I shared?*”

This step allows the person to discuss how this information impacted them. See an example of Asking below:

Community Partner: “*Well, it kind of makes sense but I am the kind of person who likes to do my own research.*”

Extension Professional: “*If you had some resources you read, you would feel more confident in being able to make up your own mind about these vaccines (reflection).*”

## ***Assess Vaccine Readiness***

Assessing readiness helps us understand how we can best support the other person ([Miller & Rollnick, 2023](#)). For example, if the person is not ready to talk about vaccines, we could start to build a relationship with them by having a conversation about their health and affirming their efforts to keep themselves healthy. If a person is very ready and wants to know how they can schedule an appointment to receive their vaccine, we can help them to come up with a plan.

Below you will find the steps of assessing a person's readiness:

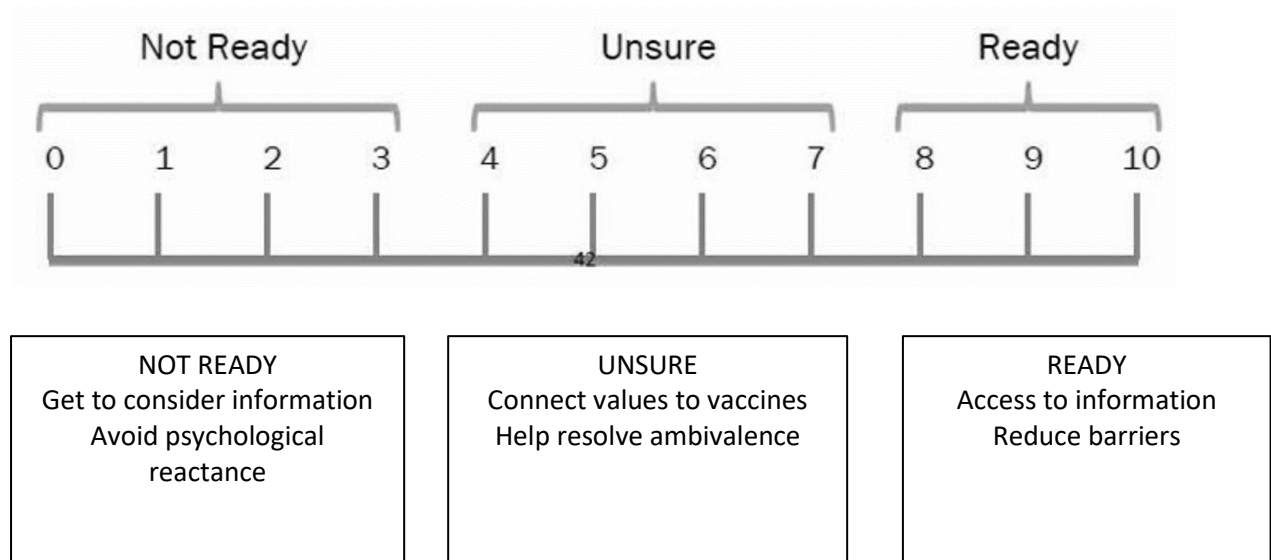
**Step 1:** Ask the person on a scale from 1 to 10, how ready they are [insert the focus of your conversation].

**Step 2:** Ask the person *why they are as high as this number and not lower*. This elicits change talk. If a person is at a 1, then affirm that they are not ready at this time.

**Step 3:** Ask the person *what would help them to become a little more ready*. This also can elicit change talk and help you understand how you can best support them.

**Step 4:** Summarize and highlight any change talk. Example: "You are at about a 3 for how ready you are to consider getting a Covid-19 vaccine. Your health and the health of your young children is important to you and if you had more reliable information about the safety of the covid vaccine, it might make you feel more ready, like at a 5 or a 6."

**Figure 3: Vaccine Readiness Assessment**



**Video Resource Box: Ask-Offer-Ask and Assessing Readiness**

**Motivational interviewing toolkit authors**

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College of Education

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WSU Research Consultant and Retired OSU  
Extension Administrator/Professor Emeritus

The video resource box includes three small portrait photos of the authors: Anya Sheftel, Pamela Rose, and another individual in the top right corner.



## **Vaccine Readiness Conversation Practice**

Instructions:

- Read through the following exchange between a Community Member and an Extension Professional.

Extension Professional: *On a scale from 1 to 10, where 1 means not ready at all and 10 means very ready, how are ready are you to ask your doctors about the MMR vaccine?*

Community Member: *Oh geez. I don't know. Um. A 4?*

**PROMPT** Write an example of a reflection that you can offer this Community Member. Remember, reflection is a statement that reflects what the person said. It could be a simple restatement or a reflection of underlying feeling or meaning.

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Community Member: *Sounds about right.*

Extension Professional: *What makes it as high as a 4 and not a 2?*

Community Member: *Well, I know that if I have my vaccines, I'll stay healthier. And I want to have children, so that could help me stay healthy during pregnancy. But what if there are side effects that I don't know about...*

**PROMPT** Write down what change talk you are hearing in the Community Member's Statement. Remember, change talk are statements of: desire, ability, reasons, need, commitment, activation, or taking steps towards change.

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**PROMPT** Write down an affirmation that you could offer this Community Member. Remember, an affirmation is a statement that reflects person's strengths, values, or goals.

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Extension Professional: *What would need to happen for you to feel a little more ready, like a 5 or a 6?*

Community Member: *I think writing down some of the questions that I have for my doctor so I don't forget to ask them, that would make me feel more prepared.*

**PROMPT** Write down a question you could ask this Community Member to move the conversation forward:

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## Reflection on Conversation Goals of Extension Professionals

A person's readiness can inform the focus of your conversation with them. Perhaps the focus of one conversation is to increase a person's importance to get a vaccination by connecting it to their values. Yet, in another conversation, the focus could be simply building a positive relationship with an Extension Professional. Yet another conversation could focus on increasing a person's confidence in talking to their family members about their decision to get a vaccine. Overarchingly, any conversation will be grounded in the Guiding MI Spirit: Partnership, Acceptance, Compassion, and Empowerment. Another way to think about this is: listen more, talk less.

For Extension Professionals, some of the most challenging conversations about vaccines may be around the topic of whether other Extension professionals or members of the community think Extension should be engaged in vaccine education. This topic provides a great opportunity to reflect on and put into practice the various motivational interviewing skills covered in this section. Remember, the motivational interviewing skill used depends on the conversation's needs. There is not a specific order to which motivational interviewing skills are used, as all can have a place in any conversation.

Here is an opportunity for you to practice having these conversations.

Imagine that an Extension stakeholder has made the following statement to you:

*"Extension shouldn't be in the business of vaccine education."*

Write out possible statements or your personal thoughts in utilizing the following MI strategies in a conversation with this partner:

Think back to Four Tasks of MI. How could you engage this person in a conversation?

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What could be the potential focus of this conversation?

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How could you Assess their Readiness?

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How could you use Ask-Offer-Ask?

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What Open-Ended Questions could you ask?

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What Affirmations could you offer?

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Write down a sample Simple Reflection:

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Write down a sample Complex Reflection:

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How could you evoke Change Talk?

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How Could You Avoid Fixing Reflex?

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## Persona Engagement

Resource Box: Vaccine Hesitancy Course and Video



Source: <https://med.stanford.edu/cme/featured-programs/vaccine-hesitancy.html>

This course was adapted from the California Coronavirus Testing Task Force, Human Centered Recommendations for Increasing Vaccine Uptake. Published June 8, 2021. Stanford CME is extremely grateful to Kaiser Permanente for permission to create this adaptation. As we see pockets of people unwilling to get the COVID-19 vaccine, we need to ask ourselves what their values are and why they perceive vaccination as a threat to such. This document presents a set of human centered recommendations to increase vaccine uptake and close the gap of herd immunity. World views are the lens through which we perceive risk and make decisions. These are deep seated and unchanging values. They can be understood and used to adapt messaging to be more effective.

Seven archetypes illustrate people's attitudes and mindsets towards COVID-19 vaccination. These archetypes provide insights into how to improve messaging and engagement to shift people towards vaccine acceptance. Specific examples of messaging and service delivery considerations are provided for each archetype.

Given the information in the video and workbook, use the worksheet below to make observations about individuals you are working with to understand the various personas. Think of three people you have recently engaged with on the topic of vaccines. Place their names in the far-left hand box. Then, based on your conversations with them, determine which persona best reflects where that individual is. Then also note what does that means you might consider when you approach a future conversation with them.

**Table 4: Personas of Engagement for Extension Professionals Worksheet (adapted from Vaccine Mindset Spectrum)**

Individuals you work with	Personas of Engagement for Extension Professionals						
Invest	Invest						
Motivate			Motivate				
Inspire						Inspire	
Individuals you work with	Steadfast Opponent	Healthy Independent	Concerned Skeptic	Indifferent Individual	Cautious Supporter	Reluctant Vaxxer	Vaccine Advocate
Name:							
Name:							
Name:							

## Resource Box: Vaccine Hesitancy Guide

The screenshot shows the 'Vaccine Hesitancy Guide' website. The header includes the site name, a home icon, and navigation links for 'Hesitancy Types', 'Medical Exemptions', 'Clinical Pearls', and 'About'. There are also language selection buttons for 'En' and 'Fr'. The main content area is titled 'Hesitancy Types' and features a dropdown menu for 'Specific vaccine hesitancies'. This dropdown is expanded to show four categories: 'Safety and science concerns', 'Influenced by rumours, conspiracies, or misinformation', 'Conflict with personal or political values', and 'Religious or moral objections to the vaccines'. To the right of the dropdown are three buttons with right-pointing arrows: 'Undifferentiated vaccine hesitancies', 'No concerns about the pandemic', and 'Pediatric vaccine hesitancies'.

Source: <https://www.vhguide.ca/>

The Guide presents advice, scripts, and resources to help navigate conversations about COVID-19 vaccines with hesitant patients. These have been developed with clinicians from across Canada.

## Contemplation Worksheet

What resonates with you about Motivational Interviewing?

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What information did you already know but maybe hadn't integrated into your work?

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What will be your next steps for employing Motivational Interviewing for vaccine education?

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## MI in Group Settings

Motivational interviewing is an effective group facilitation strategy ([Wagner & Ingersoll, 2012](#)). In a group setting, the Guiding Spirit and Tasks of MI and MI Technical Skills are used to engage group participants in a conversation, support conversations about change, build group cohesion, and focus on solutions. Think of a group as an opportunity to hear multiple perspectives and increased opportunities to evoke and reinforce change talk. Below you will find concrete strategies by [Drs. Wagner and Ingersoll \(2012\)](#) about how to use MI to engage individuals in a group conversation.

### Have a Plan

We encourage you to have a flexible plan and focus for the group conversation. It is easy to be pulled off track by multiple perspectives that might emerge during a group conversation. Having a plan that is shared with the group participants will ease the redirection of the conversation towards to topic at hand. With that said, we encourage you to maintain the stance of Partnerships, Acceptance, Compassion, and Empowerment as you move through your plan. For example, if the next item on your plan is for group participants to discuss vaccine efficacy information, yet some of the group participants appear hesitant about this topic you can (1) **Partner** with the group by acknowledging that that this topic might be challenging for some of the group members, (2) demonstrate **Acceptance and Compassion** by affirming that group members want to be thoughtful about their decisions, and (3) **Empower** group members by evoking how they made difficult decisions in the past. Note, that the last step is focused on increasing change talk among the group participants.

You may also want to start the group with reviewing Group Norms or Group Agreements. This could be a good introductory activity where group participants could have an opportunity to share and engage in a collaborative process of identifying group norms.

### Focus on the Positive

Engage the group participants and start to build group cohesion by focusing on the positive. It is easy to move into the direction of the negative, or in the case of vaccine hesitancy, why group members do not want to be vaccinated. This can disrupt the group process. To prevent this, you can use MI technical skills to (a) explore participants' reasons for attending this group, (b) briefly acknowledge the reasons why some group members are hesitant about vaccines and (c) elicit any change talk from the group.

## **Scenario 1**

Group Participant 1: *“I don’t know if I trust all the information that is out there.”*

Group Participant 2: *“Yeah! Everyone has an agenda.”*

Extension Professional: *“Some of you have concerns about what information to trust. Let me ask the group – how do you all vet information about vaccines to make sure that it is reliable?”*

## **Bring Group Participants into the Moment**

Staying in the present moment can enhance the feelings of safety and group cohesion. Sometimes group participants begin talking about the past or the future. Refocus the conversation on the current thoughts and emotions and tie together common themes across group participants. Doing so will help build a sense of comfort and trust among group participants.

## **Scenario 2**

Group Participant 1: *“I remember when my neighbor got a flu vaccine and then was really sick. I am so worried about getting sick from a vaccine.”*

Extension Professional: *“Tell me about what it’s like for you all to be a part of this group and hearing all sorts of thoughts about vaccines.”*

Group Participant 1: *“It is interesting. I am just not sure I am so ready yet. I have lots of questions.”*

Group Participant 2: *“I kind of like it. As I listen to folks talk, it makes me think more about why I haven’t gotten vaccinated yet and maybe it’s not that bad.”*

Group Participant 3: *“I actually really appreciate all the information about vaccines through the Extension Office. I hear you all, it is kind of scary with all the mixed messages out there. But it’s nice to know that there are ways to find accurate information.”*

Extension Professional: *“It is kind of scary to hear about people getting sick or vaccines not working. And I am also hearing that for some of you this group is making some things more clear, like maybe it’s not that bad and maybe actually helpful to get vaccinated.”*

### **Explore Perspectives and Focus on the Present**

To continue to build group cohesion, consider engaging group participants in values and/or strengths exploration activities. Doing so will help them share more about themselves and their perspectives in a safe and positive way. Use open-ended questions and reflections to elicit information, use affirmations to focus on the positive, and use summaries to tie together and identify common themes in statements from group participants.

### **Broaden Perspectives and Focus on the Future**

It can be helpful to focus on the present and explore perspectives as you are building group cohesion. At the same time, the focus of an MI-based group is on the future choices and actions. Oftentimes people feel stuck in one way of thinking and see their options for the future as restricted. Utilizing the many voices of the group, you can elicit multiple future goals, choices, and options, thus helping group participants broaden their sense of agency in their lives.

### **Scenario 3**

Extension Professional: *“Thank you all for sharing with me about what’s important to you and what brings you to this meeting. When you imagine your life in one year, what would it look like?”*

Group Participant 1: *“Well, I’d like to be healthy, and I’d like my kids to be healthy! We are planning a big cross-country trip.”*

Group Participant 2: *“I hope this covid thing really quiets down. I am tired of hearing about it.”*

Group Participant 3: *“I am not sure if I understand your question, but I think I just want to have a good life. Like they said, no worries and healthy.”*

Extension Professional: *“You all want to stay healthy and not feel so on edge. I heard cross-country trip, staying healthy, not worried. What decisions are you making right now that will help you achieve these goals?”*

Group Participant 2: *“We are all here, aren’t we? We want to get some clarity about vaccines.”*

## **Reflect and Explore Change Talk**

Help group participants hear each other's change talk. You can use open-ended questions, affirmations, and reflections to amplify group's change talk, thus building a stronger momentum for change. A word of caution – we don't want you to ignore participant statements about not wanting to get vaccinated or their fear about that. If you ignore those statements, the group participants will keep bringing them up because they would want to make sure that you understand their perspective. One suggestion is to briefly acknowledge those statements and then pivot to statements about change. See if you can notice this technique in the scenarios shared above.

Assessing Vaccine Readiness could also be a helpful activity. This will help group participants who are not as ready hear others' perspectives about why they are more ready. You can ask group participants to mark down on a white board where they are at in terms of vaccine readiness. Or, if you want to get them out of their seats, consider asking them to line up from 1 to 10. Then, follow the Assessing Vaccine Readiness instructions from an earlier section in the Toolkit.

## **Counteract Negative Reactions before the End of the Group**

Sometimes tensions will arise during a group conversation. Actively working to reduce interpersonal discord, acknowledging the value of everyone's contribution, and providing affirmations can reduce the feeling of tension. Think of a group activity that you can do to close out the group, such as "affirmation conga line" where each group participant has an opportunity to share what they appreciated about the group. Finally, you can have the group participants share out what next steps they may take towards reducing their vaccine hesitancy. Be sure to give the option of "passing" for participants who are not ready to think about their next steps.

## **General Considerations: Support Self-Efficacy**

The power of the group is that through working together, group participants can walk away feeling supported and heard by multiple others. Group conversations have the potential to help group participants clarify their goals. You can support this process by affirming group participant strengths and values, their past accomplishments, and their commitment to keep themselves and others healthy. It is also important to note that group members will have different goals and while some of them may experience a decrease in vaccine hesitancy, others may not. Reminding group participants that it is ok to have different goals and perspectives can reinforce their sense of autonomy.

## General Considerations: Reduce Discord

When interpersonal discord arises, come alongside the group participants. Acknowledge that this is a challenging conversation and affirm group participants' candor. Sometimes it could be helpful to shift the focus of the conversation away from a "hot" topic.

**In summary**, we encourage you to see group facilitation as an exciting opportunity to elicit and get to know multiple perspectives that your community has about vaccines. Bringing forth these multiple voices can be helpful in understanding what your community needs in terms of vaccine education and how you can best support them, with the ultimate goal of reducing vaccine hesitancy.

## Video Resource Box: MI with Groups



**Change Talk**  
(p. 23)

Miller & Rollnick, 2013

- **Desire:** *I want to change*
- **Ability:** *I can change*
- **Reasons:** *These are my reasons for changing*
- **Need:** *I need to change*
- **Commitment:** *I will start engaging in a new behavior*
- **Activation:** *I am considering change*
- **Taking Steps:** *I will/have started to take steps towards change*

Use the MI with Groups Worksheet below to practice these skills.

**MI with Groups Practice**

Instructions:

- Read through the following exchange between Community Members and an Extension Professional.

Extension Professional: *Hello everyone! Welcome to a conversation about the vaccines that are offered in our county. As you came in today, you received an informational pamphlet. Before I start with my presentation, I wonder if you have any questions.*

Community Member 1: *So, are you here to talk us into getting a vaccine?*

Community Member 2: *I, for one, am grateful to get some more information.*

**PROMPT.** Write down an example of a reflection that you can offer to both community members.

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**PROMPT.** Write down an example of a sample agenda for this meeting. Remember to emphasize participants' autonomy.

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Community Member 1: *Well, okay, that sounds good.*

Community Member 3: *I don't have any questions right now.*

**PROMPT.** Write down an example of Ask-Offer-Ask in regard to providing information about vaccine availability in your county.

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Community Member 3: *Yeah, thanks for sharing this. But I am here to learn but I don't think I want to get all of the vaccines.*

Community Member 1: *I think it's great that all these vaccines are available, but don't you think that some of them are optional? Like I hardly ever get the flu, so I never get the flu vaccine.*

Community Member 4: *Oh, c'mon folks. You know that we should be getting the flu vaccine. It's not just about you. It's about all of us.*

**PROMPT.** Go through above statements and underline parts of the statements that are focused on the willingness to learn more about vaccines or get vaccinated. Write down an example of how you can refocus the conversation towards change (think: desire, ability, reasons, need, taking steps towards getting vaccines).

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Community Member 2: *I hear you all. Sometimes I feel crummy after getting a vaccine, but it feels good knowing that I am protecting myself.*

Community Member 3: *I don't know. I don't love feeling crummy.*

**PROMPT** Reread the above statements. Identify change talk (for extra challenge, see if there is any change talk in Community Member's 3 statement). Summarize that change talk with the focus on future action.

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**PROMPT** Write down an affirmation that you could offer to the whole group.

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**PROMPT** Write down how you would end the group (remember: focus on the positive).

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## Resources for Continued Skill Development

- American Hospital Association. (2021). Human-centered recommendations for increasing vaccine uptake. Retrieved from <https://www.aha.org/system/files/media/file/2021/06/Human-Centered-Recommendations-For-Increasing-Vaccine-Uptake.pdf>
- Bidkhanian, P. A. (2023). Motivational Interviewing Technique As a Means of Decreasing Vaccine Hesitancy in Children and Adolescents During the COVID-19 Pandemic. *European Psychiatry*, 66(S1), S740-S740. <https://doi.org/10.1192/j.eurpsy.2023.1555>
- Cogordan, C., Fressard, L., Ramalli, L., Rebaudet, S., Malfait, P., Dutrey-Kaiser, A., ... & Verger, P. (2023). Motivational interview-based health mediator interventions increase intent to vaccinate among disadvantaged individuals. *Human Vaccines & Immunotherapeutics*, 19(2), 2261687. <https://doi.org/10.1080/21645515.2023.2261687>
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- Magill, M., Apodaca, T. R., Borsari, B., Gaume, J., Hoadley, A., Gordon, R. E., ... & Moyers, T. (2018). A meta-analysis of motivational interviewing process: Technical, relational, and conditional process models of change. *Journal of consulting and clinical psychology*, 86(2), 140. <https://doi.org/10.1037/ccp0000250>
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Rollnick, S., Miller, W.R., & Butler, C. (2023). *Motivational Interviewing in Health Care: Helping People Change Behavior*. Guilford Press.

Rosengren, D. (2017). *Building Motivational Interviewing Skills: A Practitioner Workbook*. Guilford Press.

Wagner C. & Ingersoll, K. (2012). *Motivational Interviewing in Groups*. Guilford Press.



# SCIENCE MEDIA LITERACY

Chapter 2

## Science Media Literacy

Remember “The Righting Reflex” from Motivational Interviewing?

(Tip: The righting reflex is our urge to correct misinformation or tell people what to do when we have important information.)

What are some examples of misinformation you have heard recently that you have wanted to correct?

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How comfortable do you feel addressing misinformation about the COVID-19 vaccine?

- Very Uncomfortable
- Uncomfortable
- Neither
- Comfortable
- Very Comfortable

Comfort in addressing misinformation, whether with COVID-19 vaccine, or any other health information topic relates to our confidence in interacting with others about the misinformation. Some people have confidence without skills. Some people have skills without confidence. We must have both confidence and skills. One without the other won't do.

The objective of the Science Media Literacy section of the toolkit is for you to leave with both more confidence and more skills for identifying and addressing misinformation in your environment.

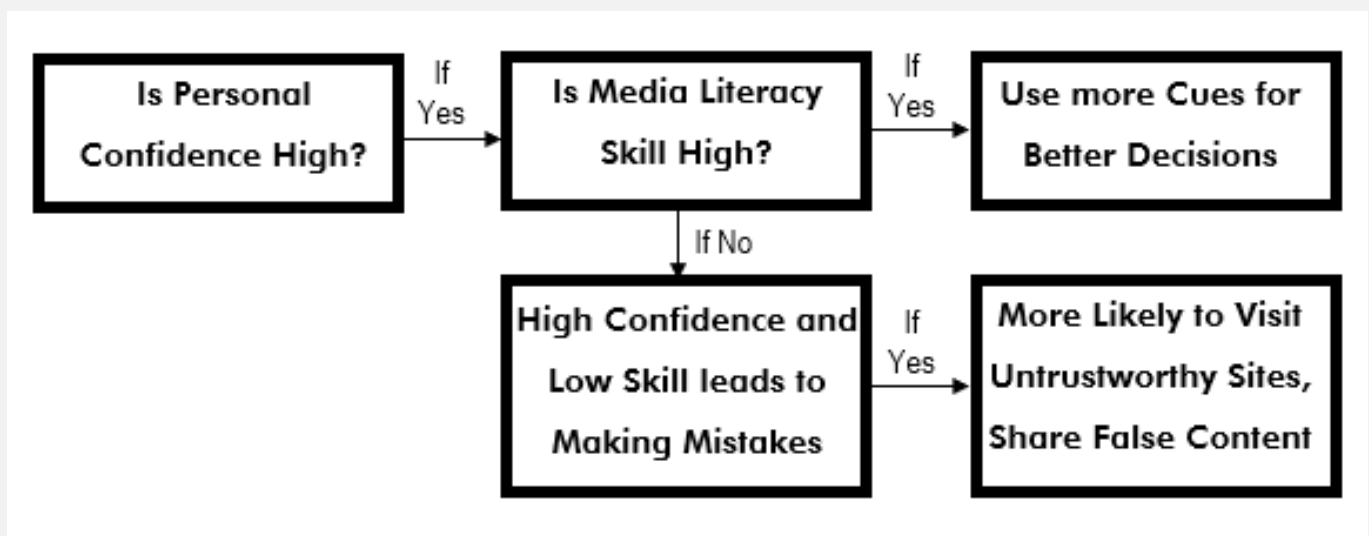
## Science Media Literacy Confidence

When it comes to confidence in our own science media literacy, survey researchers have learned that:

When people are overconfident in their news judgments it can make them more susceptible to false news. In a study by Lyons et al. (2021), 3 in 4 Americans overestimated their ability to distinguish between legitimate and false news. Having high confidence and low media literacy skill can lead to problems in navigating information environments, which in turn can cause costly mistakes that hurt people we care about in our communities and beyond.

Here is what they found in their study:

**Figure 4: Information Environment Navigation**



Source: [Lyons, Montgomery, Guess, Nyhan, & Reifler \(2021\)](#)

There is also research ([Austin et al., 2012](#)) showing that those with lesser media literacy skills used fewer cues to evaluate health information and were more likely to make mistakes about their own health, but they still felt confident about their ability to gather information.

In this study, during the H1N1 flu outbreak, college students who tended to rely on their experience level, or year in school, to predict their knowledge and confidence about their information-seeking ability to make evidence-based health choices, were likely to be wrong

about diagnosing themselves.

The ones who diagnosed themselves correctly were more likely to use multiple sources of information, media literacy skills and did not depend on the most easily accessible information. Properly assessing your own media literacy ability is important to avoid being overconfident about information you find, and making sure you critically assess that information.

*The challenge of keeping up with science information...*

## What is Science?

A variety of definitions exist. How well do these resonate with you?

- ◆ A system of acquiring knowledge. This system uses observation and experimentation to describe and explain natural phenomena (*Sciencemadesimple.com*)
- ◆ (Knowledge from) the careful study of the structure and behavior of the physical world, especially by watching, measuring, and doing experiments, and the development of theories to describe the results of these activities (*Cambridge English Dictionary*)
- ◆ An understanding of basic scientific terms, concepts, and facts; an ability to comprehend how S&T generates and assesses evidence; and a capacity to distinguish science from pseudoscience have become widely used indicators of basic science literacy (*National Science Foundation*)

Some of these definitions are static descriptions, but *science changes. Science is a process.*

That is why focusing only on facts and terms provides a very limited view. Science strives for explanations of *HOW AND WHY*.

*This means that science requires the ability to manage change.*

Teachers of science often are asked to measure “science literacy,” and the National Science Foundation regularly releases reports about science literacy. So, then what is science literacy if science changes? What should be measured?

## What is Science literacy?

- ◆ "Scientific literacy is the knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity." (*The National Science Education Standards*)
- ◆ "Scientific literacy means that a person can *ask, find, or determine answers to questions* derived from curiosity about everyday experiences. It means that a person can *describe, explain, and predict* natural phenomena." (*National Academies*)

**To summarize: Science literacy is about *critical thinking*.**

This means science is a *process*, and science knowledge therefore changes over time. It therefore requires *critical thinking*, which means science literacy requires skills to understand new information scientists make available. It does not mean everybody has to be an expert scientist!



## Science Media Literacy Skills

### **So, what skills do we need to be a competent outsider, to interpret scientific information without getting taken advantage of by charlatans?**

Fortunately for all of us, Carl T. Bergstrom, Daniel R. Pimentel, and Jonathan Osborne (2022) summarized these skills in *Scientific American* as follows:

**Scientific understanding** as a “competent outsider” requires:

- ◆ *Uncertainty*: Scientists deal with unsettled questions, and so one set of results from a single study is not seen as a definitive answer, but as a step to support certain hypothesized answers over others.
- ◆ *Peer Review*: Scientists review claims from other experts to determine if they are valid and rigorous enough to enter the ongoing scientific conversation through publication. This makes published answers credible but not definitive.
- ◆ *Expertise*: It is important to question how a person became a credible source for their scientific knowledge and whether their employer or sponsor may bias their findings in some way, such as by making the product they are testing.
- ◆ *Consensus*: Multiple observations and interpretations of data that have been considered and tested can lead most scientists to agree on a most likely explanation. Total agreement is rare, but scientific claims with broad support from the scientific community are considered a credible way to guide understanding of the world.
- ◆ *Deliberate creation of doubt*: It is important to unmask attempts to undermine confidence in scientific findings for political gain or profit.

You can read more about what they had to say about this [in their article linked here](#).

Remember, confidence begins to build as skills develop, but overconfidence in your abilities can lead to mistakes. Building a realistic view of your own skill in science media literacy will help your abilities match your confidence. This will help you verify information and avoid sharing misinformation. Knowing that science is limited, but continually improving as a process, is key to understanding how it is used in media. This will help you critically assess its applications to your own decision-making, as well as how it can help your community.

## Contemplation Worksheet

To think through how we deal with the dynamics of science as an Extension Professional, let us apply it to our own field of expertise. Think of a science topic in your field that has been evolving. For that area of science, fill in how scientific understanding has changed over time:

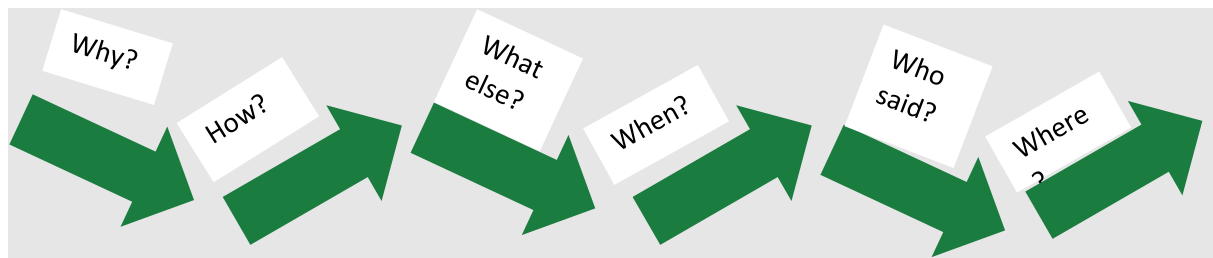
Scientific Understanding	Science topic: _____
Uncertainty	First scientific information came out saying:
Peer Review	What changes were made through peer review:
Expertise	Who were the experts in this science topic:
Consensus	When did this science topic gain some consensus:
Deliberate Creation of Doubt	How has doubt been created on this science topic:

## How Can Science Media Literacy Help?

Media literacy can help us manage an uncertain and sometimes toxic information environment.

- ◆ Media literacy is the ability to access, analyze, evaluate, create, and act using media in a variety of forms.
  - News, social media, marketing, books, films, TikTok. You can think of more examples...
  - Media literacy is about asking questions, including about science!

**Figure 5: Media Literacy Questioning Pattern**



Below are five principles of media literacy:

- All media messages are “constructed” by people and using medium/context-specific techniques.
- Media messages are produced for particular purposes (to have goals).
- All media messages contain embedded values and points of view.
- People construct their own meanings from media messages based on their skills and experiences.
- Media and media messages can influence beliefs, attitudes, values, behaviors, and society.

## What Is Science Media Literacy?

Science Media Literacy is about applying media literacy to science information. Thus, science media literacy principles can be summarized as follows:

- All media messages that contain science information are “constructed” by people and using medium/context-specific techniques.
- Media messages that contain science information are produced for particular purposes (have goals).
- All media messages that contain science information contain embedded values and points of view.
- People construct their own meanings from media messages that contain science information based on their skills and experiences.
- Media and media messages about science can influence beliefs, attitudes, values, behaviors, and society.

It is important to keep in mind that science information can be embedded in news, entertainment, marketing, social media posts, health campaigns, sports, books, everyday conversations, and all sorts of other communication vehicles. We learn from news, entertainment, games, stories, marketing, music, and so on.

## Science Media Literacy Needs Assessment Scores

In a survey of approximately 1,000 U.S. Extension professionals in 2022, the Washington State University EXCITE Project Team asked a series of science media literacy questions to help assess whether a science media literacy toolkit could be of interest for helping to manage misinformation for science and health news.

The following table shares Extension Professionals' responses about science media literacy in a needs assessment conducted in 2022. The results suggest that professionals, on average, do each of these media literacy thinking and checking behaviors sometimes, and additional analysis showed that they tend to do each of these things at a similar rate compared to the other things. On average, the results showed that they had some room to improve on their skills even more, and the analysis showed that their media literacy skills associated with their comfort in handling misinformation in their communities. Specifically, they were asked, “How comfortable do you feel addressing misinformation about the COVID-19 vaccine?” On a scale of 1 (Very Uncomfortable) to 5 (Very Comfortable), the professionals responded on average at 2.86, and their level of science media literacy was associated with their misinformation comfort level even after statistically controlling for their years serving in Extension. This suggested that science media literacy was a valuable contributor to their ability to manage the misinformation environment even after having had years of experience to gain an understanding of their communities and Extension processes.

For some, simply answering the science media questions might have provided a good reminder to keep doing these thinking and checking behaviors!

**Table 5: Science Media Literacy Needs Assessment, 2022 WSU EXCITE Needs Assessment**

	<b>Item</b>	<b>Mean (1 Never/ 6 Every Time)</b>
S O U R C E	I check whether those who create science news know about the topic	3.72
	I think about what point of view a science broadcaster or writer is trying to support.	4.12
	I look to see if those who share science news on social media have checked the accuracy of their facts.	3.65
	I think about whether sources of science news have my best interests in mind.	4.00
	I think about whether those who provide science information might be doing so to gain power or profit.	3.94
	I get science news from multiple sources to make sure I get the full story.	4.20
C O N T E N T	I think about how scientists can draw different conclusions from the same science facts.	3.97
	I check to see if a science fact in a news story is backed up by a credible source.	4.10
	I check to see if a picture or graph accurately matches the scientific information it represents.	3.86
	I check to see if the science news I read is up to date.	4.23
	I think about whether a news story with real science facts could still lead to a false conclusion.	3.82
	I have changed my thinking about a science topic when I received new information.	3.62

If you completed this needs assessment questionnaire, what number would you have given yourself to each question? Please record your number next to the scores above.

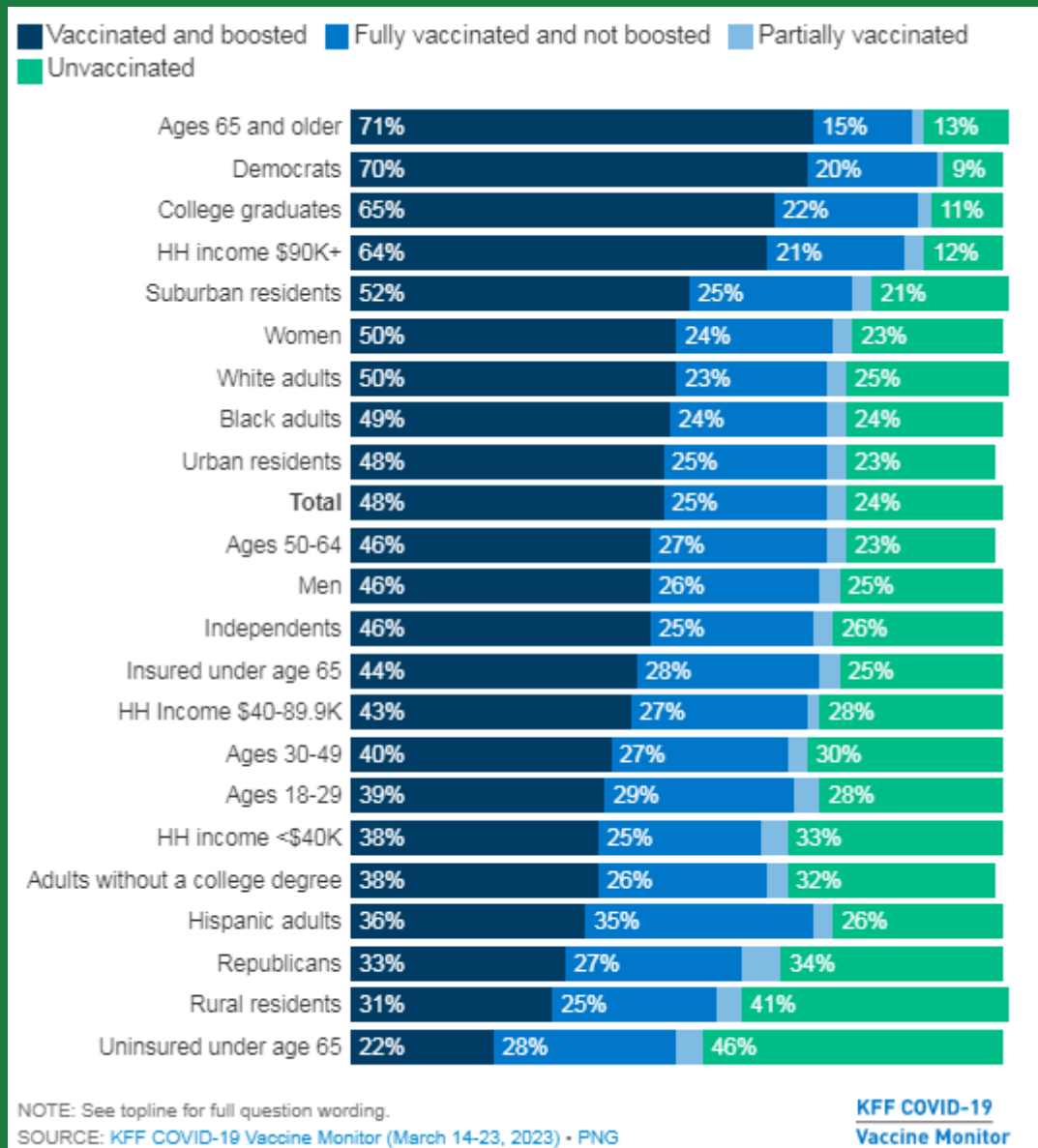
As you continue to build your science media literacy skills, think about converting these Source and Content items, from the questionnaire, into questions. Consider the questions in Figure 6 for assessing and developing science media literacy.

You can ask these as questions throughout this workbook. Is there evidence and citations for the information provided? Do the charts and graphs make sense? Is this workbook created by individuals with content expertise? Are multiple sources for principles about science media literacy provided? Can people draw different conclusions about the material? Is the material up to date? Is any of this material changing my thinking in any way?

## Are we talking about literacy, or trust, or some of both?

Consider how widely vaccine trust varies: Where are people getting their information? How are they making their decisions?

### Resource Box: KFF COVID-19 Demographics



Source: <https://www.kff.org/coronavirus-covid-19/dashboard/kff-covid-19-vaccine-monitor-dashboard/#vaccines>



Trusted sources are key to public health—and to prevent misinformation. Your trusted sources in the community can help combat misinformation on the internet ([Calac et al., 2022](#)).

Available studies on misinformation tend to not formally consider patient perceptions of healthcare providers and organizations as a mitigating or amplifying factor accounting for misinformation acceptance, per se. There is a robust literature on trust in patient and provider relationships, but the potential intersection of that work with misinformation research warrants more attention than it has received historically.

When you think about your community, what and/or whom would community members state as some trusted sources of information?

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Would Extension be listed as one of those trusted sources? Why or why not?

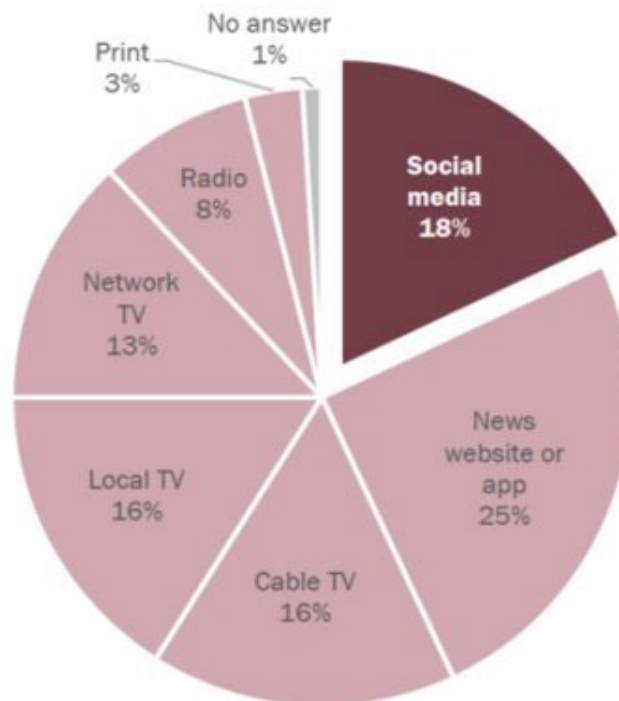
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People used to use the same sources for news, but that is no longer the case:

## About one-in-five U.S. adults say they get their political news primarily through social media

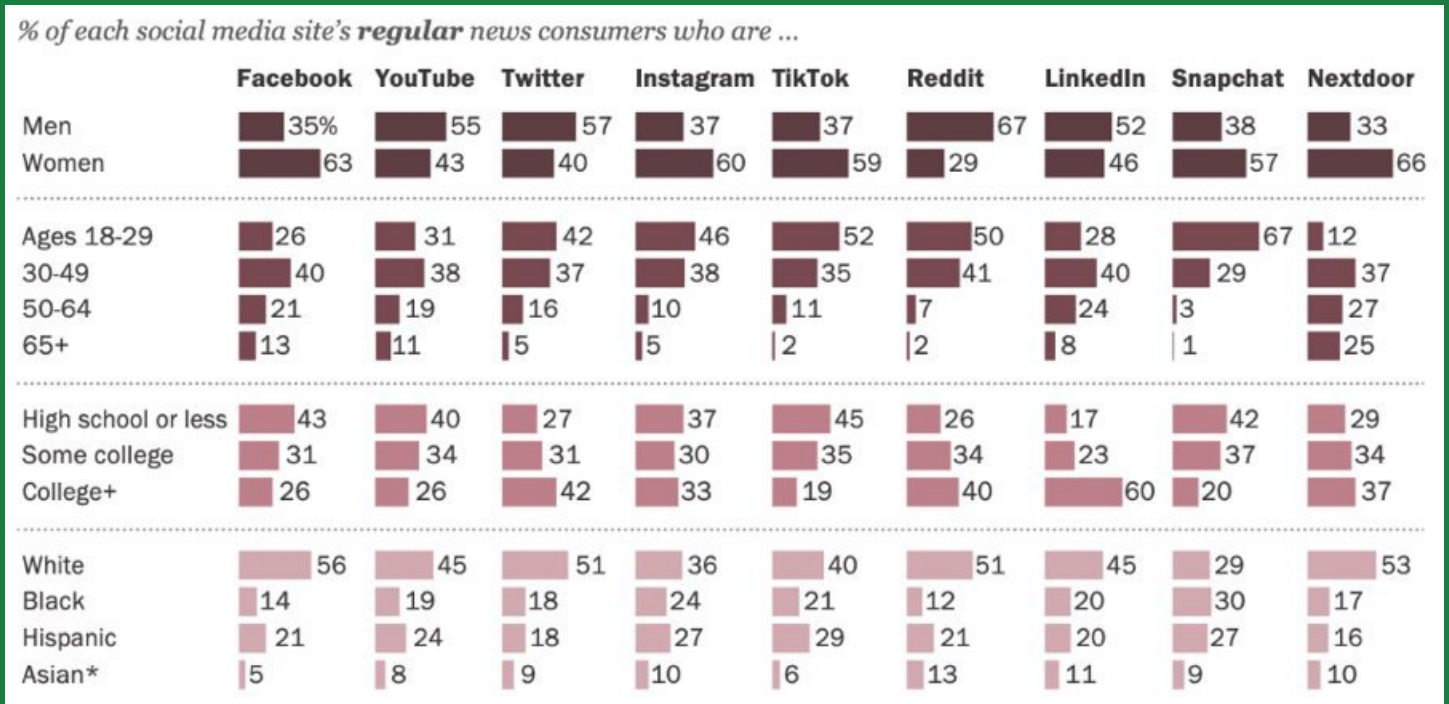
% of U.S. adults who say the most common way they get political and election news is ...



Source: Survey of U.S. adults conducted Oct. 29-Nov. 11, 2019. "Americans Who Mainly Get Their News on Social Media Are Less Engaged, Less Knowledgeable"

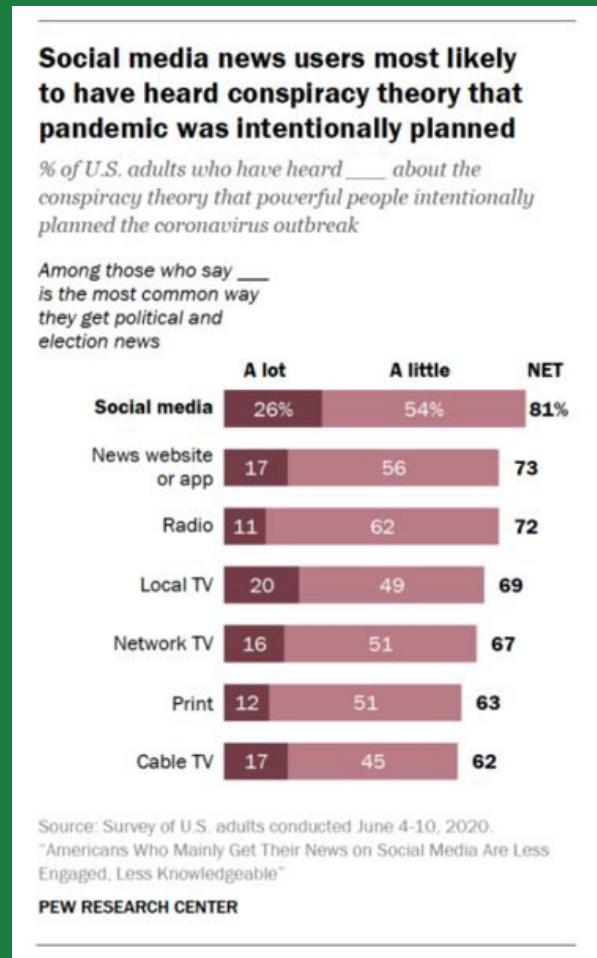
Source: <https://www.pewresearch.org/journalism/2020/07/30/americans-who-mainly-get-their-news-on-social-media-are-less-engaged-less-knowledgeable/>

This is an example of how much variety there is in the ways people are using social media for news. Identifying a single trusted source is going to be impossible!



Source: <https://www.pewresearch.org/journalism/2020/07/30/americans-who-mainly-get-their-news-on-social-media-are-less-engaged-less-knowledgeable/>

On the other hand, it is easy to spread misinformation on social media, because people who use social media create echoes across their own communities.



Source: <https://www.pewresearch.org/journalism/2020/07/30/americans-who-mainly-get-their-news-on-social-media-are-less-engaged-less-knowledgeable/>

About a quarter of U.S. adults who get most of their news through social media (26%) say they have heard “a lot” about this conspiracy theory, and about eight-in-ten (81%) have heard at least “a little” – a higher share than among those who turn to any of the other six platforms for their political news (Mitchell et al., 2020).

## Contemplation Worksheet:

Where do you go to get your information/content?

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What sources do you trust?

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What do you think about when evaluating whether you will trust a new source of information/content?

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Who in your circle of friends, colleagues, or community members do you trust?

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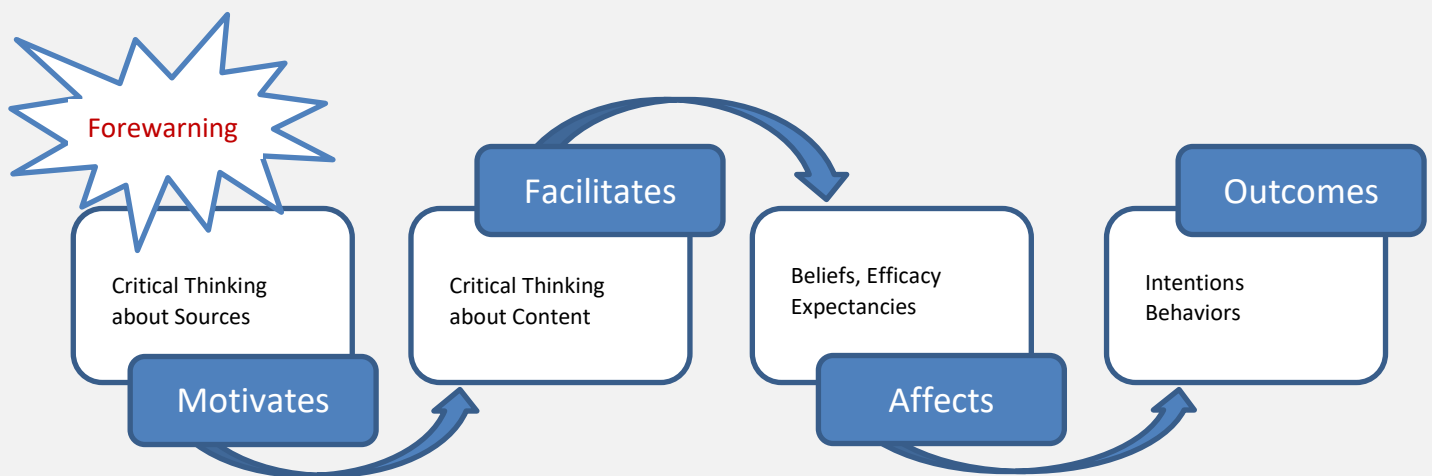
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## Media Literacy Theory of Change

**Figure 6: Logical and Emotional Decision Making**

Decision making is partly **logical** and partly **emotional**



© Erica Weintraub Austin 2023

We need our **emotions** to work **for** us instead of **against** us

The media literacy theory of change attempts to explain how we interact with and make decisions about the media we interact with in our daily lives. When we are *forewarned* that sources might not always be acting in our best interests or might not always be accurate and truthful, we tend to critical think about message sources.

If we start to think more critically about message sources, that *motivates* critical thinking about content, which *facilitates* more critical conclusions about what is happening in the world (beliefs), more confidence about things we can accomplish (called efficacy), and more evidence-based if-then beliefs about what will happen when we put certain behaviors into action (expectancies).

These conclusions *affect* all sorts of *outcomes*, such as what we talk about and post about on social media, what we intend to do when we have the opportunity, what behaviors we exhibit when we are in public, and when we are with our families or by ourselves, and what we actually do when faced with barriers and opportunities.

The Media Literacy Theory of Change tells us that this process is not just a logical one. Our emotions can help us, or they can get in the way. It is important to remember that our emotions are an important part of our decision-making, and we need to pay attention to them as much as we pay attention to our other thoughts. Some sources will try to take advantage of our emotions to inhibit critical thinking. The *forewarning process* is designed to help you prevent this from happening.

## The Science Media Literacy Infographic:

This science media literacy infographic was created to provide a guide to help the user find accurate and credible science information to make their own better health decisions. There are 4 parts to the process, but **they do not need to be done in any specific order**.

### ***Consider The Source***

A critical part of our science media literacy skill set is to determine if the source is trustworthy and credible. What is the perspective of the source, and did they have relevant expertise? Are they trying to sell a viewpoint or product? Can you determine if other reputable organizations say that this source is trustworthy and knowledgeable? Have fact-checking databases or retraction databases called this source into question?

### ***Examine The Content***

Before quickly, trustingly repeating information, science media literacy skills encourage an examination of the content. Just in case. Just to make sure. Does the author cite their sources? Is the information current or out of date? Are there typos that indicate something might be unprofessional? Ideally you will look across multiple sources to verify if you are getting consistent information about the topic?

### ***Check Your Emotions***

Although we often may not realize it, our emotional reactions to a message can provide valuable clues about the information we absorb. How does the message make you feel? Misinformation can trigger emotions like anger and fear, including the fear of missing out on a popular trend or sale. Stop and think before sharing or believing an upsetting or tempting message. These clues can alert you that the source does not have your best interests at heart and instead may be trying to sell a product or viewpoint. You may find that checking your emotions is the **FIRST** step to take rather than the third step!

### ***Ask Trusted Experts***

Another aspect of determining credible and accurate information is to ask a trusted expert. If you are not sure about something or just want an additional opinion, seek out someone you trust who has the expertise needed. For example, ask your doctor or medical professional any questions about your health or your children's health. Local librarians are great resources, too, and they can help you find others.



Figure 7: Science Media Literacy Infographic

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## HOW TO RECOGNIZE MISINFORMATION

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### CONSIDER THE SOURCE

Take time to look up a source on your phone or a new window.  
Double check the expertise or credentials of people on social media.  
Do other reputable organizations say this source is credible?



### EXAMINE THE CONTENT

Evaluate the claims made by social media posts.  
Does the author cite their sources? Is the information out of date?  
Check across multiple sources for consistency.



### CHECK YOUR EMOTIONS

Emotional language is meant to persuade you, not always inform.  
Misinformation often uses angry and fearful messages.  
Are your emotions hurting your ability to critically think?



### ASK TRUSTED EXPERTS

Work with and ask experts when you are not sure about something.  
Health decisions are based on health, not politics.  
Ask your local doctor about vaccines and other health decisions.

## **Now try critically assessing a story using the Science Media Literacy Infographic**

As Extension professionals, you are translators of expert information.

From the needs assessment we know that Extension professionals have a range of science media literacy skills and confidence addressing vaccine science misinformation.

The people you are talking with also will have varying levels of media literacy skills and confidence.

This infographic can help you provide an intentional, structured forewarning strategy to help others build science media literacy skills.

Please click the link below to practice critically assessing a story using the Infographic:



[Example article for exercise using the Infographic](#)

Using the Infographic as a tool, what assessments can you make about this story from Regenerative Medicine Center from 2023?

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## Contemplation Worksheet

What resonates with you about the science media literacy infographic?

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What information did you already know but maybe hadn't integrated into your work?

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What are some of the ways you might utilize the infographic with groups? In individual conversations?

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## Example Of Misinformation News Cycle:

Part of becoming more astute in our science media literacy skills is understanding more about the misinformation news cycle. The following data is from a study by [Simon, Howard, and Nielsen \(2020\)](#) at the Reuters Institute about COVID-19 misinformation.

Misinformation tracked early in the COVID-19 pandemic:

Most misinformation is not totally made up. N=225, Jan-March 2020, Simon et al. (2020), rated false or misleading by Fact Check sites.

1. Satire or parody
2. False connection (headlines, visuals or captions do not support the content)
3. Misleading content (misleading use of information to frame an issue or individual when facts/ information is misrepresented or skewed)
4. False context (genuine content is shared with false contextual information, e.g., real images which have been taken out of context)
5. Imposter content (genuine sources, e.g., news outlets or government agencies, are impersonated)
6. Fabricated content (content is made up and 100% false; designed to deceive and do harm)
7. Manipulated content (genuine information or imagery is manipulated to deceive, e.g., deepfakes or other kinds of manipulation of audio and/or visual) (88%) from social media, 9% TV, 8% (9%), news outlets (8%), 7% websites.

## Resource Box: Types, sources, and claims of COVID-19 misinformation

### Figure 2: Reconfigured vs fabricated misinformation

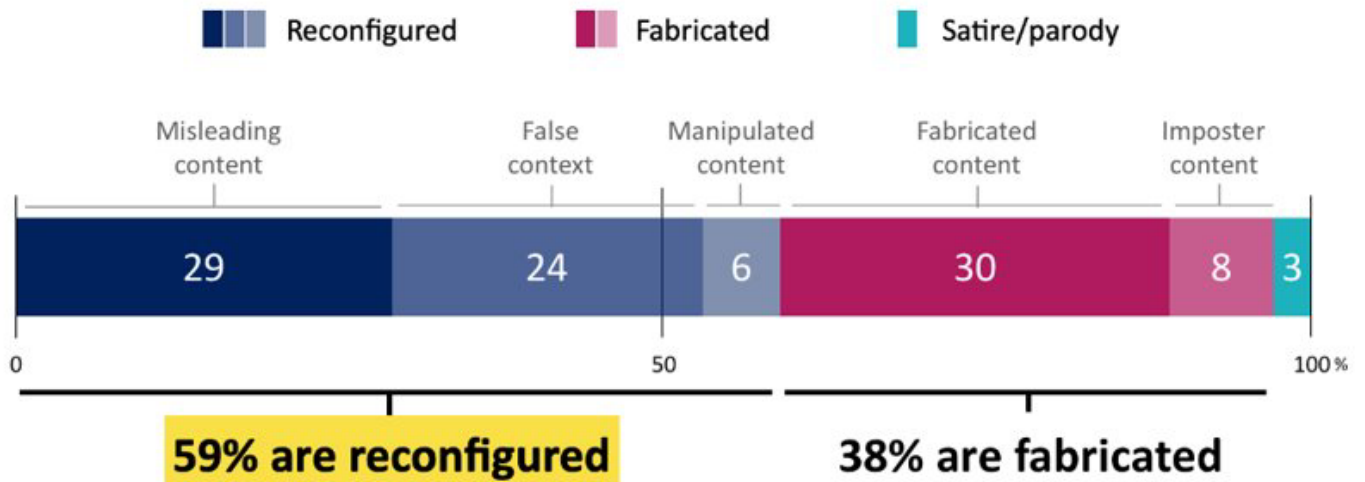


Figure 2 shows the proportion of reconfigured (N=133) and fabricated (N=86) misinformation in the sample (N=225) and the types of misinformation that constitute both reconfigured and fabricated misinformation.



(Figure below is a screenshot taken from [Reuters Institute on their site about Types, sources, and claims of COVID-19 misinformation](#) in May of 2023).

For more reading on how false information is affected by social dynamics, check out the article by [Duffy, Tandoc, and Ling \(2018\)](#).

## Resource Box: World Health Organization Misinformation Tracking

- 5G Mobile networks
- Alcohol
- Antibiotics
- Bleach
- Cold weather, snow
- Dexamethasone
- Drugs
- Garlic
- Hand dryers
- Holding your breath
- Hot and humid climates
- Hot baths
- Hot peppers
- Houseflies
- Hydroxychloroquine
- Masks, CO2 intoxication
- Masks, exercise
- Medicines
- Methanol, ethanol
- Misinformation
- Mosquitoes
- Older people, younger people
- Pneumonia vaccines
- Recovery
- Reduce risk of infection
- Saline
- Shoes
- Sunny and hot weather
- Supplements
- Swimming
- Thermal scanners
- Ultra-violet (UV) lamps
- Viruses, bacteria, antibiotics

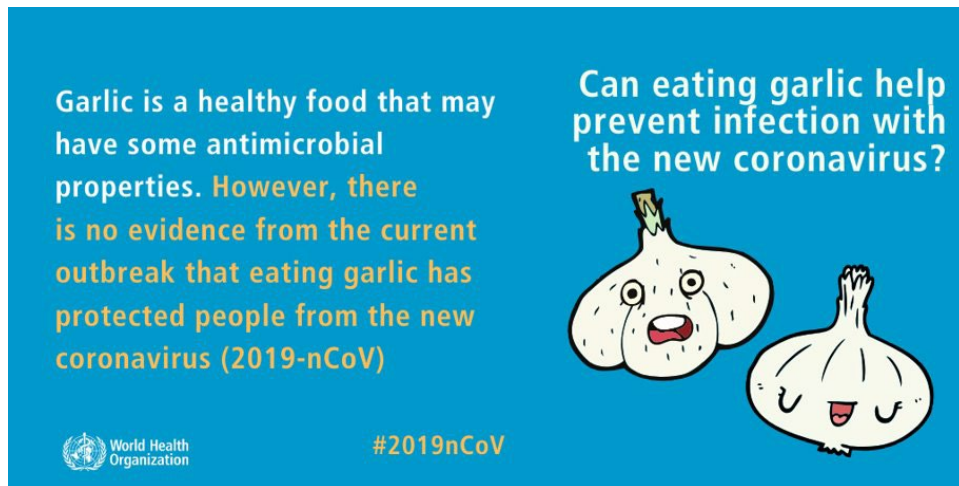
The World Health Organization (WHO) tracked the following misinformation and disinformation topics – (This page was screenshotted from WHO on March 26, 2021. [The updated link with different topics can be found here](#)).

Disclaimer: Because of the continuous updates made by the World Health Organization to their debunking website, some links may not work. The World Health Organization continued to update its misinformation pages and discontinued some of the topics as information was updated and some misinformation topics faded from apparent urgency.

To access these sources as they were captured in the screenshots, please visit [The Way Back Machine](#) and copy and paste the link into the search bar and go to the time referenced.

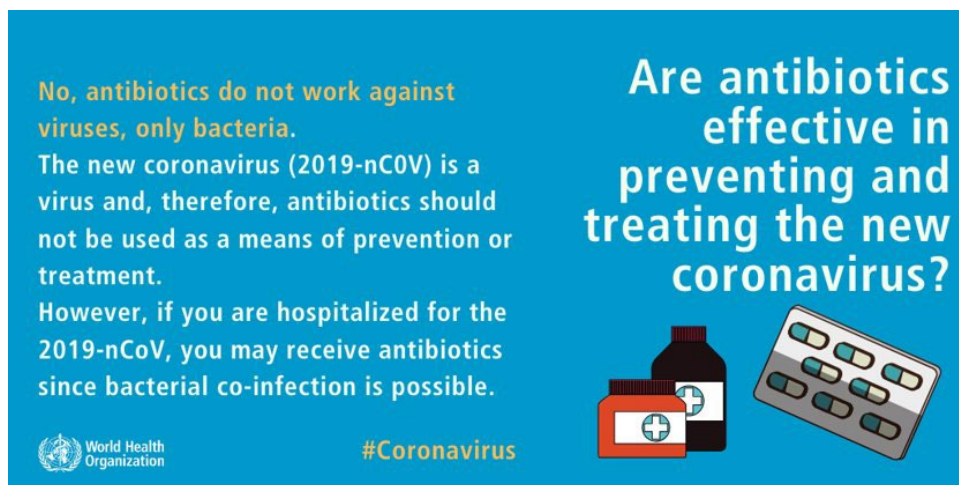
This screenshot was saved from the World Health Organization [WHO \(2022\)](#) early in the COVID 19 pandemic.

Misinformation: Garlic



The percent of people who thought this info was correct in two U.S. national surveys our team did in 2020: April-59.3 % vs July-68.7 % ([Austin et al., 2021](#)).

Misinformation: Antibiotics



The % of people who thought this info was correct in the U.S. national surveys we did in 2020: April 49.4 % vs July 54.5 % ([Austin et al., 2021](#)).



According to a report by [the Center for Countering Digital Hate \(2022\)](#), the Disinformation Dozen are twelve anti-vaxxers who play leading roles in spreading digital misinformation about COVID vaccines. They were selected because they have large numbers of followers, produce high volumes of anti-vaccine content or have seen rapid growth of their social media accounts in the last two months.

**Resource Box:** [The Disinformation Dozen](#)



2. Analysis of a sample of anti-vaccine content that was shared or posted on Facebook and Twitter a total of 812,000 times between 1 February and 16 March 2021 shows that 65 percent of anti-vaccine content is attributable to the Disinformation Dozen.

a. Research conducted by CCDH last year has shown that platforms fail to act on 95 percent of the Covid and vaccine misinformation reported to them.

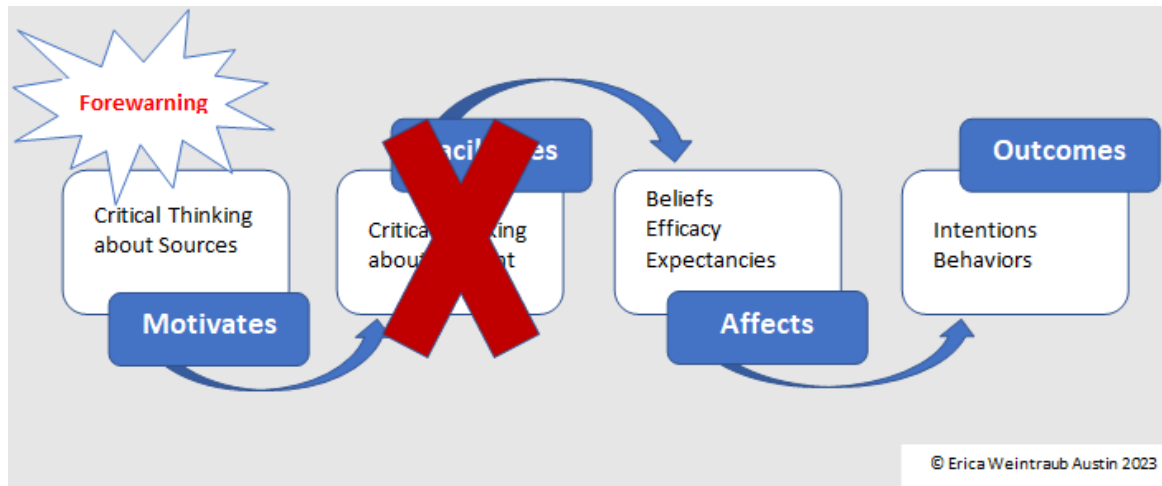
b. CCDH's recent report, Malgorithm, uncovered evidence that Instagram's algorithm actively recommends similar misinformation.

Too often this happens when influencers try to mislead the public: “Like me, trust me, do what I tell you (and do not trust others)”

When we only consider the source and go right to our own beliefs, efficacy, and expectancies, we miss a crucial step in the theory of change, the step of critically thinking about the content.



Remember the Media Literacy Theory of change model we covered earlier? When emotions about a source cloud our ability to evaluate and critically think about the content of information, it can hinder our beliefs and decision-making.



We need our emotions to work for us instead of against us!

Using the Science Media Literacy Infographic and Motivational Interviewing skills, how might you respond to someone who comes to you and says:

“My friend heard on the news that young people’s deaths are up, and it is because of the COVID vaccine.”

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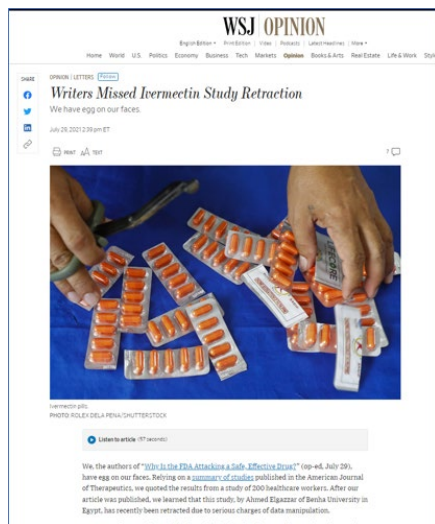
## It sure can be tough to keep up with fake science!

Sometimes the peer review process can allow bad science to get through and get published. Sites like those listed below, try to correct the spread of misinformation as it occurs. By recognizing retractions, correcting the use of unsupported science, and forewarning about how some scientific information is communicated in media, these efforts help push science media literacy forward.

Check out these articles for examples:

[WSJ Opinion Article \(Henderson & Hooper, 2021\)](#)

[The Scientist \(Thomasy, 2022\)](#)




You can also double check if scientific articles have been retracted from their journals using [Retraction Watch \(2023\) website](#).



Below is an example of an article that was retracted. Energetic discussions about this article and about the value of ivermectin as a COVID-19 treatment for humans have continued to go on in the scientific literature, so it can be useful to check with experts for the latest news on this topic.

**Open Forum Infectious Diseases**

[Open Forum Infect Dis](#), 2021 Nov; 8(11): ofab358. PMCID: PMC8420640  
Published online 2021 Jul 6. doi: [10.1093/ofid/ofab358](https://doi.org/10.1093/ofid/ofab358) PMID: [34796244](https://pubmed.ncbi.nlm.nih.gov/34796244/)

 **This article has been retracted.**  
Retraction in: [Open Forum Infect Dis](#), 2022 March; 9(3): ofac056 See also: [PMC Retraction Policy](#)

**Retracted: Meta-analysis of Randomized Trials of Ivermectin to Treat SARS-CoV-2 Infection**

[Andrew Hill](#),<sup>1</sup> [Anna Garratt](#),<sup>2</sup> [Jacob Levi](#),<sup>3</sup> [Jonathan Falconer](#),<sup>4</sup> [Leah Ellis](#),<sup>5</sup> [Kaitlyn McCann](#),<sup>5</sup> [Victoria Pilkington](#),<sup>6</sup> [Ambar Qavi](#),<sup>5</sup> [Junzheng Wang](#),<sup>5</sup> and [Hannah Wentzel](#)<sup>5</sup>

▸ [Author information](#) ▸ [Article notes](#) ▸ [Copyright and License information](#) [Disclaimer](#)

See the article "[Ivermectin for the Treatment of COVID-19 Disease: Too Good to Pass Up or Too Good to Be True?](#)" in volume 8, ofab318.

**An expression of concern has been published for this article.** See [Open Forum Infect Dis](#), 2021 August; 8(8): ofab394.

**This article has been retracted.** See [Open Forum Infect Dis](#), 2022 March; 9(3): ofac056.

## Resource for Continued Skill Development

Below is an example from “*Stories from the Field, Partnering for Vaccine Equity*,” published by the Centers for Disease Control and Prevention featuring regional success stories, located at <https://www.cdc.gov/vaccines/health-equity/field-stories.html>.

Locally driven partnerships and community-designed solutions are essential for addressing the root causes of health disparities and ensuring health equity. However, it takes time to build trust within many communities that are underserved and experience distrust of governmental institutions. The approach of the Association of State and Territorial Health Officials’ (ASTHO) is to develop community-driven solutions designed to provide leadership opportunities, technical support, and advocacy for community action programs. This type of public health/community action partnership is a model that can be applied nationwide. The regional presence and capacity of Community Action Program agencies (CAPs) to reach deeply into communities are an often-untapped resource for public health. They enable public health to work more directly with community members and community organizations on a more local level.

CAPs are non-governmental community-based agencies working with the governmental health and human services system. Authorized under the 1964 Economic Opportunities Act, state health and human services departments contract with CAPs using the federal Community Services Block Grant (CSBG). CAPs have a long history of assisting people experiencing economic insecurity and housing instability, as well as providing support for people living with disabilities. They serve people in every age group – from infants in Women, Infants, and Children (WIC) program clinics to young children in [Head Start](#) to seniors receiving heating assistance and home care. CAPs also have the infrastructure in place to handle administrative functions on behalf of smaller nonprofits, such as procurement, payroll, and fiscal management.





With funding from the CDC, ASTHO is working with the [National Community Action Partnership](#) to engage five CAPs and their respective networks of local community action teams in five geographic areas:

- Pickens Community Action – Pickens County, AL
- Enrichment Services Program, Inc. – Russell County, AL and Troup and Stewart Counties, GA
- Community Action Partnership of Kern – Kern County, CA
- Community Action Program for Central Arkansas—White County, AR
- Palmetto Community Action Partnership – Berkeley County, SC

ASTHO CEO Michael Fraser says, “the result of this work will be instrumental in informing future vaccination efforts in our member states and territories.”

These CAPs take [evidence-based strategies](#) to increase vaccine equity and tailor them to their own communities. For example, in Berkeley County, South Carolina, Palmetto Community Action Partnership works with the South Carolina Department of Health and Environmental Control (SCDHEC) and Fetter Health Care Network (Fetter) to promote vaccination during patient visits. SCDHEC provides nursing outreach teams who administer on-site vaccinations at events throughout Berkeley County. Fetter administers flu vaccines at its income-based health clinic in rural Berkeley County, and patients are encouraged to receive them through [ASTHO’s Vaccine Equity Project](#). Palmetto Community Action Partnership held COVID-19 vaccination events during the summer with a focus on fun. A “Sports Extravaganza” vaccination event was held at a recreation facility in Moncks Corner, South Carolina featuring retired NFL players and members of the Charleston Southern University football team. A “Community Day” in partnership with [Jean Angels](#) at Berkeley High School featured food trucks, jump castles, and a partner resource fair.

The CAPs mentioned above are addressing vaccine hesitancy by working with local leaders to serve as trusted messengers. These include faith-based leaders, local providers such as physicians but also community health workers and emergency medical technicians (EMTs). They are also engaging their local medical and nursing



schools to build up the next generation of providers as vaccine champions.

These CAPs are seeking to dispel distrust and misinformation by sharing credible information through as many means as possible: through social media, traditional media, and most importantly through one-one-conversations at local health fairs and vaccine clinics. Their trusted messengers share stories of how and why they were vaccinated. In addition, the CAPs meet the holistic needs of their community members by addressing the [social determinants of health](#): they provide food, housing, and utilities assistance, job training programs, and childcare for low-income families. With their reputation as trusted resources, and their extensive network of local partnerships, the CAPs reach those harder-to-reach segments in their communities.



ASTHO's new partnership with these CAPs serves as a promising example of public health/community action collaboration to improve the health of individuals in the community and increase vaccine equity in areas that face disparities. ASTHO believes such partnerships can be replicated to address other types of health equity issues such as chronic disease prevention or improving [community resiliency](#).

Here are a few questions for reflection from this case study:

- What steps does this Association seem to be taking that seems consistent with a motivational interviewing approach?
- What role might science media literacy play to help them as they build these partnerships and strive to build trust?
- Can you think of any brain-friendly examples of communication strategies they employed while communicating with their communities?
- What motivational interviewing techniques might you utilize in your conversations with your own community groups?



# NEUROMARKETING

## Chapter 3



## What Is “Neuromarketing?”

Neuromarketing is a scientific approach to creating and delivering effective communication content. This approach draws on brain science to gain actionable insights for creating content that resonates and works with (as opposed to against) the way human brains uniquely process and respond to information.

The use of Neuromarketing by global corporations has exploded as an approach to optimizing all kinds of content across communication channels and technological platforms. Companies are predicted to spend a total of \$3.2 billion on Neuromarketing solutions by the year 2032 (<https://www.futuremarketinsights.com/reports/neuromarketing-solutions-market>). The growth in Neuromarketing is due to a highly competitive business environment and the power of Neuromarketing to inform the development and delivery of content that effectively achieved communication objectives.

Neuromarketing is a unique tool that Extension professionals can also use to succeed at achieving communication objectives tied to their community outreach and engagement mission. The science underlying Neuromarketing focuses on understanding the human brain and communication involving media content delivered over media technologies. This science is not specific or exclusive to marketing or advertising.

Neuromarketing science goes beyond the intuitive principles of content design you may have learned in your professional life. Correct use of this tool by Extension professionals requires the following:

1. Applying direct knowledge of how the human brain is structured and processes the information you communicate as an Extension professional
2. Defining all communication content and technology from the perspective of the human brain and not traditional communication/media industry perspectives
3. Generating actionable insights that guide the production and delivery of communication content so that communication efforts effectively engage, educate, and empower community members as part of the community outreach mission of Extension

## Why Use “Neuromarketing” As A Communication Tool?

Neuromarketing science empowers professional communicators, like Extension professionals, to combine brain and communication science with their existing level of creative intuition and expertise to design and deliver communication content that more effectively and consistently achieves desired objectives. This occurs by mixing creativity with a scientific understanding of the human brain and how the human brain processes communication content delivered over communication technologies. A scientific understanding of the human brain is grounded in current principles of how our human mind works (covered below). A scientific understanding of how the human brain processes communication requires understanding communication from the perspective of the brain and not communication industries. This requires professional communicators to focus on the design and use of communication elements like visuals, language, size, color, motion, camera angles, tempo, emotional tone, etc.

The human brain defines communication based on the experience that the “sensory” elements of communication content evoke. The brains of the audiences for communication content do not process information based on industry definitions of communication such as flyers, public service announcements, radio ads and public service announcements, etc.

The application of Neuromarketing science gives Extension professionals a tool for developing, designing, and delivering communication content that can be said to be “brain friendly!”

Brain friendly content brings together all the “sensory” elements of communication content in a way that:

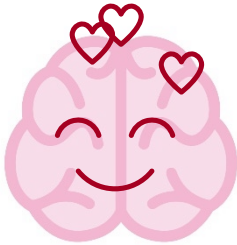
1. Effectively engages the audience by capturing and sustaining attention
2. Effectively educates the audience by structuring content to enhance memory for key “messages” in the content
3. Effectively empowers the audience through the presentation of accurate scientific information and an emotional tone that enhances attention and memory for the communication content

We want to develop “brain friendly content” not “brain unfriendly content.”

**Brain Friendly Content**

**Not**

**Brain Unfriendly Content**

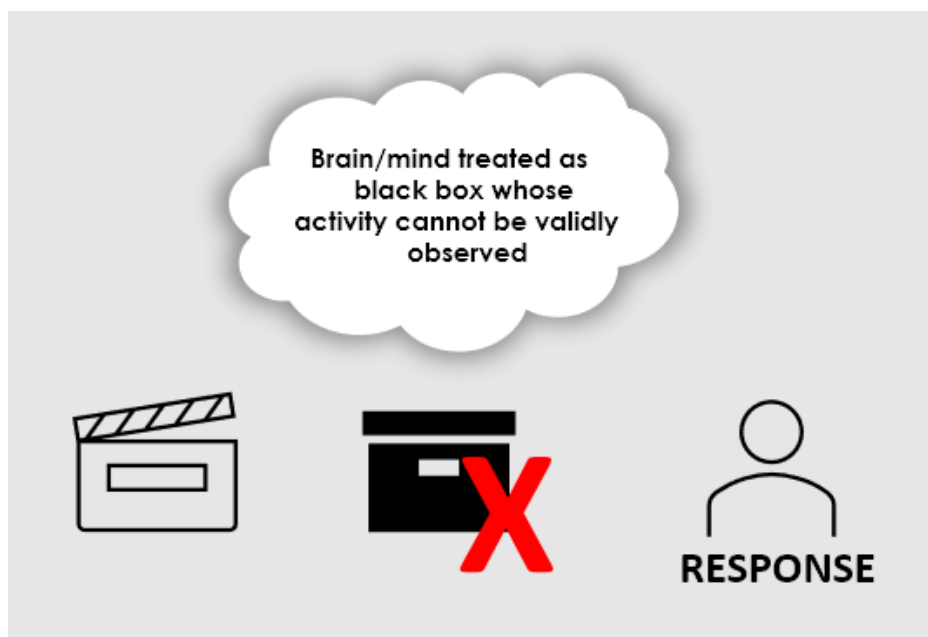


The development, design and delivery of brain friendly content begins with a basic knowledge and understanding of the human brain.

## Understanding The Human Brain and Communication

Thankfully you do not need to be a brain science expert to develop, design, and deliver brain friendly content! You do need to understand some basic principles of how our human minds, that exist in the functioning of the human brain, work.

**Mind Principle 1:** Communication efforts can fail through “ignorance” of how the human mind processes AND responds to content:



- The human mind that is embodied in the human brain, nervous system, and body is what experiences, processes, and responds to communication content.
- Communication content can be produced based solely through creative intuition that often contains an elevated level of ignorance about the human mind or through creativity enlightened by an understanding of how the human mind works.
- Communication efforts developed without Neuromarketing science treat the brain/mind like a black box that content gets shoved into in hopes of evoking a desired response. This is relying on creative guesswork that is at best informed by creative intuition rather than science. Creative intuitions have some usefulness in the design of effective content. Effective communication in the complex, often politicized and emotional, contexts of science communication, that Extension professionals need to engage in, especially requires breaking open the “black box” and specifically producing brain friendly science communication content.
- Brain friendly communication content, informed by an understanding of how the human mind processes AND responds to content is less likely than content based

only on creative intuition to elicit defensive responses or completely fail at engaging the audience.

**Mind Principle 2:** We may “feel” like we know *why* we make decisions, but we really do not know!

- The human mind produces conscious experiences that offer us convenient explanations of our world and our behaviors in it.
- The human mind, embodied in the brain, unconsciously constructs reality created through communication content, and predicts what will be an effective response to any communication content. (See the following podcast featuring Dr. Lisa Feldman-Barrett, <https://www.3takeaways.com/episodes/lisa-feldman-barrett-neuroscientist>)
- Audience members may think they know precisely how and why they respond in certain ways to communication content, but they do not!

**Mind Principle 3:** Attitudes and behaviors are primarily driven by unconscious, cognitive and emotional processes.

- Observational data obtained from audience members may accurately describe attitudinal and behavioral responses to communication content but cannot explain how or why communication content leads to responses in a way that can be used to inform the effective development, design, and delivery of communication content.
- The extent to which communication content leads to desired attitudes and behaviors primarily depends on unconscious cognitive and emotional processes that are automatically engaged as audience members encounter and interact with communication content.

The human brain creates a conscious mind that makes us think that we can see why and how we respond to specific communication content, but we don't!

Most of the "work" the brain does while processing and responding to communication content occurs on an unconscious level.

The "sensory" elements of communication content that professional communicators can control first and foremost engage unconscious brain processes that determine responses to communication content.



**Mind Principle 4:** Brain scientists have categorized the activity of the human mind into two kinds of processes, "automatic - unconscious" and "controlled - highly conscious" processes

- Automatic, unconscious processes lay the foundation for communication effectiveness and dominate how audience members respond to communication content.
- Controlled conscious processes can help individuals purposefully increase or withdraw a degree of attention paid to communication content and slightly regulate the intensity of emotional responses to content
- The influence of motivational interviewing and increased science media literacy (covered in previous sections of this tool kit) on how individuals mentally process and respond to communication content occurs through controlled/conscious, NOT, automatic/unconscious processes
- A famous cognitive scientist Daniel Kahneman has developed a model that describes how we make decisions. This model extends the idea of automatic and controlled processes into what he has termed "system 1" and "system 2." System 1 operates in an intuitive, unconscious, and extremely fast manner. System 1 fuels most of the decisions we make, including attitudinal and behavioral responses to communication content. System 2 operates in a highly conscious, purposeful, deliberative manner. It takes significant mental effort for System 2 to have a high degree of influence on the

decisions we make. Every decision we make involves varying influences of System 1 and System 2 on attitudes and behaviors. Attitudinal and behavioral responses to communication content are never the result of only System 1 or only System 2 processes.

- The key to developing, designing, and delivering brain friendly content is knowing how to produce communication content activates BOTH System 1 and System 2 through the strategic selection and design of content elements that will effectively engage, educate, and empower community members that are the audience for specific communication efforts.



### System 1 – Intuition & Instinct

- Unconscious
- Fast
- Automatic processing

### System 2 – Rational thinking

- Takes effort
- Logical
- Controlled processing

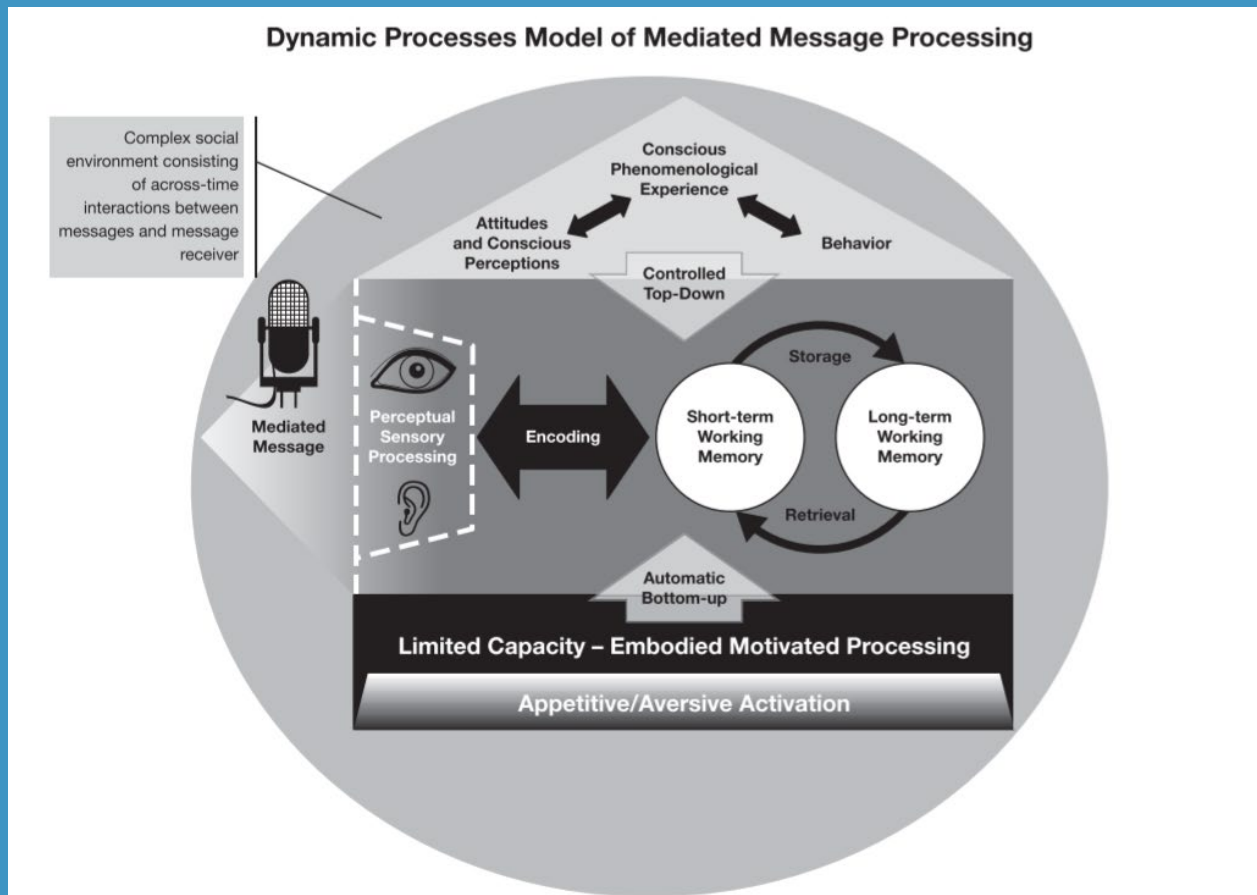
**NOTE:** Decision making, including audience responses to communication content involves the activity of BOTH System 1 and System 2. Brain friendly communication content will have design (e.g., color/layout) and content (e.g., copy/language) elements that are strategically used to engage both System 1 and System 2.

**Mind Principle 5:** The human mind does a lot of work processing communication content. Most of the work is unconscious/automatic

- Conscious phenomenological experience is what our brain consciously produces as we interact with and respond to communication content. This experience emerges from the activity of many unconscious cognitive and emotional processes.
- These unconscious cognitive and emotional processes broadly involve human attention, emotion, and memory/learning processes embodied in brain activity.
- Unconscious cognitive and emotional processes evoked by the specific “sensory elements” of communication content direct all conscious attitudinal and behavioral responses to communication content.

- This “Basic Principle” of the human mind describes what is termed the Dynamic Processes Model of Mediated Message Processing. This model describes all the mental processes involved in effectively engaging, educating, and empowering audiences through brain friendly communication content!

**Figure 8: Dynamic Process Model of Mediated Message Processing (Potter and Bolls, 2012)**



Potter, R. F., & Bolls, P. (2012). *Psychophysiological measurement and meaning: Cognitive and emotional processing of media*. Routledge.



## Brain “Truths” for Brain Friendly Content

The “Mind Principles” listed above describe current scientific understanding of the nature of brain activity that underlies how our human mind processes information and helps us adaptively respond to it. These principles can be distilled into three valuable “Brain “Truths” for brain friendly communication content. These “Brain Truths” can be used to help guide creative choices concerning communication content as Extension professionals engage in the processes of developing, designing, and delivering content that is central to the mission of educational outreach intended for specific communities. The practical value of these “Brain Truths” comes from the fact that they are fundamental truths about the human brain. These “Brain Truths” are not restricted to any specific audience or focus of educational outreach effort. Each truth has practical implications for producing brain-friendly communication content.

### **Brain Truth 1**

#### The brain is a limited capacity processor

- The overall amounts as well as number of distinct “bits” of information in communication content can overload cognitive capacity of the targeted audience causing memory for the content to suffer.
- The practical implication of this brain truth is that Extension professionals must focus on:
  - Developing content that highlights one central message with a maximum of two or three supporting messages communicated in a clear, uncluttered manner
  - Designing content to be delivered in a concise manner with as few “bits” of distinct information as possible. Bits of information are defined according to the number of distinct pieces of sensory information the brain of an audience member is expected to process. This can be viewed as the “cognitive load” that communication content places on the brain.
  - Delivering content in a way that makes it as easy as possible for audience members to cognitively process (pay attention and learn) the central, most valuable information in the communication content.

## **Brain Truth 2**

### **The brain is a contextual/culture processor**

- Cultural “cues” in communication content increase the motivational relevance of the content and the context in which content is delivered determines attention and memory.
- The practical implication of this brain truth is that Extension professionals must focus on:
  - Developing content that is informed by expert understanding of the cultural background, emotional triggers, values, and pre-existing attitudes of the intended audience.
  - Designing content with sensory elements (e.g., visuals, words, colors) that resonate with the cultural background of the intended audience and in a form (layout) that focuses attention on relevant cultural cues.
  - Delivering content over channels/technology platforms that are culturally relevant to the intended audience and are as uncluttered as possible.

## **Brain Truth 3**

### **The brain is a motivated/emotional processor**

- Raw motivations related to approach/avoid in combination with emotional responses determine how individuals will process and respond to communication content. These emotional processes determine how the brain will process and respond to communication content within milliseconds of exposure to the content. Brain friendly communication content that is intended to educate community members **MUST** resonate with them at an emotional/motivational level.
- The practical implication of this brain truth is that Extension professionals must focus on:
  - Developing content that strategically includes sensory elements that explicitly connect with current emotional triggers the intended audience feels toward the subject of the content.
  - Designing content that strikes the best mixture of positive and negative emotional tone based on the emotional context surrounding the topic. A rule of thumb is that most science related topics have both positive and negative emotional characteristics that should be explicitly included in communication

content.

- Delivering content over channels/technology platforms that evoke a positive user experience using sources/spokespeople that have strong, positive emotional affiliations with the intended audience.

## How can Extension Professionals apply Neuromarketing Science?

Neuromarketing Science is a tool for Extension professionals to use to develop, design, and deliver brain friendly communication content which effectively engages, empowers, and educates community members they serve. A fundamental belief in the value of educational outreach is a component of the Extension Agent's Creed. Brain-friendly communication content is the core of effective educational outreach. How might Neuromarketing science tie into the discipline of Education?

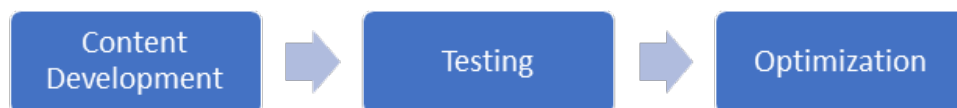
The field of Education is becoming increasingly integrated with Neuroscience to form what is termed Neuroeducation. The objective of Neuroeducation is to optimize educational experiences through knowledge of how the human brain learns information (see Kim, Si. (2012). Neuroeducational Approaches on Learning. In: Seel, N.M. (eds) Encyclopedia of the Sciences of Learning. Springer, Boston, MA. [https://doi.org/10.1007/978-1-4419-1428-6\\_1823](https://doi.org/10.1007/978-1-4419-1428-6_1823)). Neuroeducation – applying brain science to learning – and Neuromarketing Science – applying brain science to developing brain friendly communication content – creates an ideal approach to the unique communication tasks Extension professionals must accomplish. The unique tasks involved in effectively developing, designing, and delivering content for specific educational outreach efforts that successfully engages, educates, and empowers community members.

There are two ways that Extension professionals can apply Neuromarketing Science as a tool for communication content.

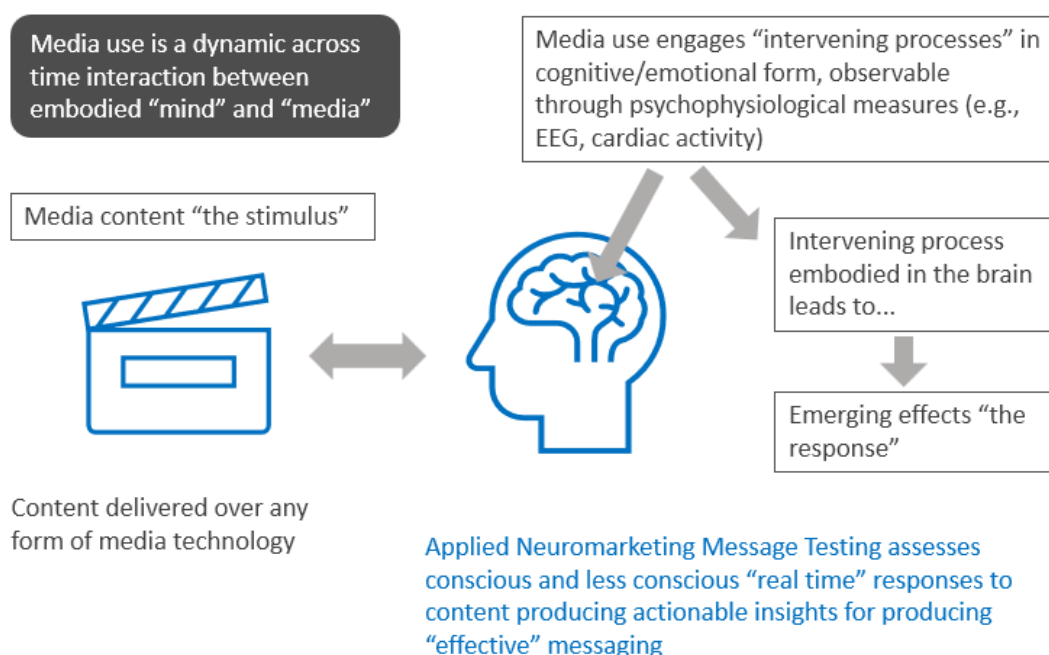
1. Extension professionals can apply an understanding of how the human brain/mind processes information (see “mind principles” listed above) to develop content that is strategically informed by brain science. This application can encompass the processes of content development, design, and delivery as well as evaluation and refinement of content.
2. Extension professionals can engage with a partner to conduct applied Neuromarketing Science content testing. This involves the collection of biometric measures (eye tracking, heart rate, facial muscle activity, etc.) that directly test how individuals mentally process specific characteristics of communication content. The results of content testing are translated into actionable insights that can be used to for developing, designing, and delivering content that effectively engages, educates, and empowers community members. Applied Neuromarketing Science content testing also generates insights that go beyond optimizing a current communication

effort to producing generalizable insights for the development, design, and delivery of brain friendly content across multiple communication efforts.

**The Process of Using Applied Neuromarketing Science Content Testing using biometric measures of brain activity to produce actionable insights for producing brain friendly communication content:**



**Applied Neuromarketing Message Testing  
Actionable Insights into the Brain “on” Messaging**



Extension professionals can effectively use Neuromarketing Science as a tool for producing brain friendly communication content by using these two applications separately or in combination with each other. The crucial point to remember is that application one only involves application of knowledge about the brain that can be gained from sources like this toolkit. Application two requires connecting with a partner that has a prominent level of Neuromarketing expertise and the technology for conducting applied Neuro marketing testing. You can contact Dr. Paul Bolls (pbolls@wsu.edu), a co-author of this toolkit, for more information about Neuromarketing partners.

## Contemplation Worksheet

What surprised you about the three brain truths?

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What information did you already know but maybe hadn't integrated into your work?

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Can you think of a recent experience where these brain truths were ignored? How would have applying these brain truths helped that situation?

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Let us think about how the brain works and the communication content of websites. Please click and review the following websites.

<https://whitmancountypublichealth.org/>

<https://www.healthygallatin.org/>

What are some of the brain friendly elements you notice in each of these websites? What are some of the brain unfriendly elements you notice in each of these websites?

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*We now turn to specifically considering Neuromarketing Science as a communication content tool in the context of the issue of Covid-19 vaccination. Information presented in this section can be applied to health science topics beyond this specific issue.*

## Neuromarketing in the Context of Vaccine Education

Applied Neuromarketing Content Testing was performed to produce specific, generalizable, actionable insights about content elements in messaging about Covid-19 vaccination. We tested characteristics of photographs and text-based framing of the issue of Covid-19 vaccination.

### **Neuromarketing-based Message Testing**

Extension professionals participated in two different on-site neuromarketing testing of messages. The photo shows an individual connected to the various instruments used to measure responses.



AEA (American Evaluation Association)

August 2022 Orlando, FL



NAE4-HYDP (National Association of Extension 4-H Youth Development Professionals) October 2022 Madison, WI





Photo Credit: Dr. Toby Lepley, Associate Vice-President and State Youth Development Program Leader, Louisiana State University Agricultural Center

**Objective:** Identify visual and text content elements that are likely to effectively engage Extension Professionals in favorably responding to Extension and Covid-19 Vaccine Messaging

***Vaccine Message Content Tested***

- Photos depicting “vaccination”  
Emotional tone (unpleasant) and Dominance of Vaccine Cue
- Textual framing that ties Extension to Covid-19 Vaccine education through emotional appeal and Extension values

***Examples for Visuals:***



Source: Appalachian Regional Healthcare System



Source: Unsplash

**Examples for Textual Framing:**

"Covid-19 Vaccine education fits with the mission of Extension Professionals because we believe in intellectual freedom to search for and present the truth without bias and with courteous tolerance toward the views of others."

## Actionable Insights – Visual Framing

Effective vaccine education content begins with “brain friendly” visuals that:

- Capture attention and elicit a mixture of positive AND negative emotional responses
- Evoke positive attitudes that will enhance mental processing of text
  - Positive attitudes
    - Favorable
    - Desirable
    - Likable
    - Informative

### ***Brain Friendly Visuals***

Highly Effective

Brain friendly visuals that are highly effective in terms of elicit positive emotions and attitudes towards vaccination education utilizing pleasant emotional tone and avoiding high presence of vaccination cues, such as needles, vaccine bottles, or image of virus.



## Moderately Effective

Brain friendly visuals that are considered to be moderately effective utilizing pleasant emotional tone with high presence of vaccination cues.



Source: ERIC SEALS/USA TODAY NETWORK/SIPA

In sum, brain friendly visuals utilizing pleasant emotional tone, and the presence of vaccination cue is less matter compared to the emotional tone.



## ***Brain Unfriendly Visuals***

### ***Visuals to Avoid***

Images with highly unpleasant tone and high presence of vaccination cue eliciting negative attitudes toward vaccination education among Extension professionals, which is not recommended to use in vaccination education.



### ***Double Edged Sword***

Visuals with unpleasant emotional tone and low presence of vaccination cue is a double-edged sword. Empirical data from both neuromarketing science method and self-report method showed that images with unpleasant emotional tone effectively attracted attention to some extent. However, it also evoked negative responses toward the content, and the content was perceived to be less desirable and favorable.



Source: Kaiser Permanente of the Northwest

## Actionable Insights – Textual Framing

### What is “brain friendly” textual framing?

- Engaging attention and emotion in a way that enhances memory/learning
  - Lowering negative feelings
  - Increasing self-efficacy
- Two primary “framing” strategies for Extension vaccine education
  - Emotional frames (Gratitude; Empathy, Pride)
  - Extension Value frames

### ***Brain friendly “Emotional” framing***

“Empathy for constituents” is the most brain friendly in emotional framings in terms of letting Extension professionals feel more willing and comfort for conducting vaccination education and has a positive effect on cognitive engagement. “Pride in Expertise” is the second emotional framing that is perceived to be effective and can be used as an alternative to “empathy for constituents” framing.

### **Empathy for Constituents**

Extension Professionals who are willing to engage in Covid-19 Vaccine education with their clients/constituents can demonstrate empathy for constituents through their work.

Extension Professionals can be equipped to deliver vaccine education in ways that treat individuals who are afraid of vaccination with respect and does not involve intimidation, humiliation, or even persuasion. Extension should avoid a “savior complex” especially in rural areas. Just share general information about vaccinations, how they work and how they are developed.

### **Pride in Expertise**

Extension Professionals who are willing to engage in Covid-19 Vaccine education with their clients/constituents can feel pride in their expertise used to educate their community.

Extension Professionals have tremendous ability to understand vaccines and the science behind them. Extension has a history of providing vaccine education to Livestock producers, youth, and adults. Extension has a history of providing evidence-based education. We can be proud to engage in programs that lead to more thoughtful decision making.

### ***Brain friendly “Extension Value” framing***

“Link between people and scientists” framing is highly recommended. “Believe in intellectual freedom” framing can be used on a light rotation as an alternative to the first framing.

#### **Link between people and scientists**

Covid-19 Vaccine education fits with the mission of Extension Professionals because we believe that Extension is a link between the people and the ever-changing discoveries produced by expert scientists.

#### **Believe in intellectual freedom**

Covid-19 Vaccine education fits with the mission of Extension Professionals because we believe in intellectual freedom to search for and present the truth without bias and with courteous tolerance toward the views of others.

### ***Brain unfriendly framing***

Brain unfriendly framings evoke more negative emotions and more reactance towards vaccination education.

#### **Examples:**

Covid-19 Vaccine education fits with the mission of Extension Professionals

... because education is basic in stimulating individual initiative and self-determination.

... because we believe in our own work and in the opportunity, we must make our lives and the work we do as Extension Professionals useful to humanity.

### **Sample Message Template Script (Creative Brief)**

Communities served by Extension have a critical need for respectful science-based vaccine education. Many community members have significant concern and confusion about the benefits and risks of vaccines. Extension professionals uniquely identify with the community members we serve. We can be a critical bridge between our communities and vaccine science. We can take pride in using our expertise to understand vaccines and the science behind them to produce programs that foster thoughtful decision making and empower ourselves with scientific knowledge.

Extension professionals are dedicated to treating individuals who are concerned about the risks of vaccination with respect, without intimidation, humiliation, or even persuasion about human vaccines. Extension vaccine education is Extension expertise and empathy, bridging science and our communities.



## Contemplation Worksheet

How do these actionable insights resonate with you and/or with the work you do?

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What information did you already know but maybe hadn't integrated into your work?

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In what other areas can you apply these actionable insights besides vaccine science content?

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## Application of Neuromarketing Science as a “TOOL” for brain-friendly vaccine science education content:

### **Neuromarketing Science & Vaccine Science Content**

- Neuromarketing Science has a valuable role to play in producing and delivering effective vaccine science content by:
  - Guiding production of “brain friendly” content
  - Providing new “data based” actionable insights
- “Effective” “brain friendly” vaccine science content will engage, educate, and empower individuals to make evidence-based health decisions

### **The Problem: “Three brain truths” in “overdrive”**

The “Brain Truths” previously presented in this toolkit can be used to develop, design, and deliver brain friendly communication content about vaccine science. Extension professionals MUST remember, however, that these human brain characteristics ALWAYS impact how community members mentally process and attitudinally and behaviorally respond to all information. The highly politicized and potentially emotionally explosive communication context that can still surround Covid-19, and vaccine science in general, makes processes described by the “Brain Truths” even more influential in shaping community responses to related communication content.

Here is how:

### **The Brain is a Motivational Emotional processor**

Vaccine Science information/misinformation is extremely emotional/political, priming “aversive/defensive” responses

### **The Brain is a Limited Capacity processor**

Vaccine Science information contains a lot of “bits” of changing information tied to the evolving science

### **The Brain is a Cultural/Contextual processor**

Cultural background and experiences creating disparities and distrust shape the communication context and filter how Vaccine Science is interpreted and responded to

**The Solution: Respect the “Three brain truths” and follow the practical advice given in the previous section about brain truths!**

# Contemplation Worksheet

The Brain is a Motivational Emotional processor.

Brain Unfriendly

Brain friendly



Campaign Materials for Vaccinate T&T, Ministry of Health, Government of the Republic of Trinidad and Tobago & AdTechCares

Note the reasons why one ad is brain unfriendly, and the other ad is brain friendly:

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## The Brain is a Limited Capacity processor:

Brain Unfriendly



Brain friendly



From the U.S. Department of Health and Human Services Website, COVID-19 Public Education Campaign

Note the reasons why one ad is brain unfriendly, and the other ad is brain friendly:

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**The Brain is a Cultural/Contextual processor:**

Brain Unfriendly

Brain friendly

**CLINICA SIERRA VISTA**

*Hope & Healing*  
**COVID-19 VACCINES**

Clinica Sierra Vista, Community Action Partnership of Kern, Circle of Life Development Foundation, #MLKcommUNITY, Kern County Latino Covid-19 Task Force, United Against Covid-19, Upside Productions, Kern County Black Chamber of Commerce and Girl Trek are partnering to provide COVID-19 vaccines in our community. First come first served. Moderna COVID-19 2-dose vaccine.

**United Against COVID19**

**Capk** **CIRCLE OF LIFE** **GirlTrek** **Kern County Black Chamber of Commerce** **#MLKcommUNITY**

**LATINO COVID-19 TASK FORCE**

**ad COUNCIL**

**IT'S UP TO YOU :: COVID-19 VACCINATION**

Get the latest information about COVID-19 vaccines at [GetVaccineAnswers.org](http://GetVaccineAnswers.org)

**Saturday, April 24th 8:00am-4:00pm**  
**CLINICA SIERRA VISTA**  
**East Niles Community Health Center**  
7800 Niles Street Bakersfield, CA 93306

Please Make Your Appointment and Register at [appointment.clinicas ierravista.org/eastniles](http://appointment.clinicas ierravista.org/eastniles)

Getting back to these moments we miss starts with getting informed.

**IT'S UP TO YOU :: COVID-19 VACCINATION**

**ad COUNCIL**

Get the latest information about COVID-19 vaccines at [GetVaccineAnswers.org](http://GetVaccineAnswers.org)

Source: Clinica Sierra Vista & The Ad Council

Note the reasons why one ad is brain unfriendly, and the other ad is brain friendly

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# Practical Advice for Developing “Brain Friendly” Vaccine Science

## Content

Brain Friendly vaccine education content will include content that engages BOTH “Intuitive” AND “Rational” thinking

### ***Use production features to engage System 1***

- Camera angle and shot length
- Color Schemes
- Font size
- Production pacing and “effects”

### ***Use copy/content to engage System 2***

- Write copy/content to highlight key points
- Write copy/content to empower
- Write copy/content to evoke feelings
- ❖ Brain Friendly vaccine education content for “vaccine hesitant” communities **MUST** reduce defensiveness and emotionally resonate to motivate individuals to consider and act on information

Brain Friendly vaccine science content needs to “tame the Elephant” meaning highly negative emotional and defensive responses that have been primed by the politicized and emotional communication environment that surrounds vaccine science.

- Feature “relatable” real humans
- Feature positive emotional content (hope)
- Acknowledge risks (negative affect)
- Use calming color schemes
- Use inclusive language “we”
- Avoid highlighting “vaccine” cues
- Avoid unintended politicized cues
- Avoid “red” or similar color schemes
- Avoid “directive” or “loss-frame” content

## Utilize the Bite-snack-meal for content design

When developing content, consider the amount of content people can absorb in the communication content format. Thinking about this food analogy helps with making the decisions about the right amount of content to include.



Source: <https://martech.health/articles/how-to-market-to-physicians-is-medical-jargon-the-answer>

## Contemplation Worksheet

Think about some content that you are currently working on. With the Bite-Snack-Meal strategy in mind, record what content you might share in each situation.

Consider each of the Right Sizes	Content Topic: _____
Bite size	
Snack size	
Meal size	



Video Resource Box: Brain friendly vaccine video

[Whitman County's COVID-19 Vaccine Journey - Linda's Story](#)



What evidence is there for this to be a good example of a brain friendly vaccine video?

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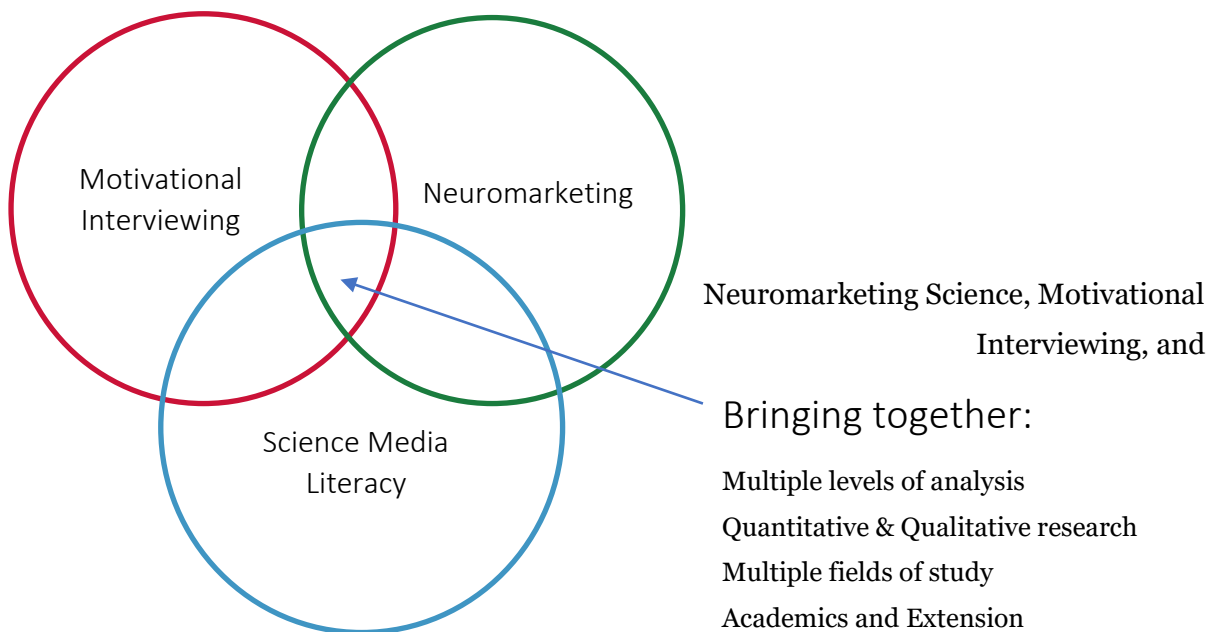
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# CONCLUSION

# Integrating Neuromarketing Science, Motivational Interviewing, and Science Media Literacy in Mental Processing of Vaccine Science Content

**Returning to Figure 1:**



Science Media Literacy provide insight into distinct but related processes in how individuals mentally process and respond to vaccine science content. These three tools can be used by Extension Professionals to develop communication tactics for effectively “engaging” with community members. Motivational interviewing and Science Media Literacy are primarily tools that can help you gain a deeper understanding of specific community members. Neuromarketing Science is a tool for using knowledge about the human brain to produce and deliver effective communication content.

## Contemplation Worksheet:

What overlaps do you see between neuromarketing science, science media literacy, and motivational interviewing?

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How do emotions (your emotions as well as the emotions of those you interact with) play into your communication strategies?

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What value do these tools bring to your interactions with other Extension Professionals, partners, and community members?

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What takeaways will you now build into your work because of learning about these three tools?

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# APPENDIX

## Appendix: Figures and Tables & Additional Handouts

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