

Investigating Motivation and Learning as Factors that Affect Attitudes

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Disclaimer

The American Psychological Association (APA) and the Gay & Lesbian Alliance Against Defamation (GLAAD) discourage the use of the terminology “homosexual”, and instead recommend the use of one’s gender identity preceded by “gay” (e.g., gay male). The term “gay” is also often used as an umbrella term for the whole LGBTQIA+ community which could lead to confusion and misinterpretation of the research. Furthermore, this terminology does not take into account the full range of gender identities, or individuals who may have multiple gender identities, which could lead to heterocentric writing issues.

The author of this paper fully understands the problematic historical usage of the terminology “homosexual”. The author also recognizes that some within the LGBTQIA+ community are trying to reclaim the term “homosexual” to get beyond the previous negative connotations. With all this said, the term “homosexual” will appear in this document. The use of the terminology in this report is made without any connotation established in prior literature, cited or not. It reflects the terminology used in some of the measures used (implicit and explicit).

To be clear on the use of the terms in this report, the author uses the terms “homosexual” and “gay” to solely mean individuals who are attracted to those of the same gender and/or sex. This is done with the intention to be as inclusive as possible given the link between gender and sexual orientation when using “gay men” or “lesbian women”. The author respects that the language describing members of the LGBTQIA+ communities is constantly evolving, so apologizes for any discomfort that may arise due to the use of this terminology.

Abstract

The current experiment examined whether the type of interpersonal motivation (affiliative or epistemic) and the type of information participants received (social or individual) influenced their likelihood to social tune. While past work shows that affiliative and epistemic motivations will lead to social tuning, the type of information received has not been examined. To examine the influence of motivation and learning, 245 participants were primed via a sentence unscrambling task with affiliative motivation, epistemic motivation, or no motivation. Participants then viewed an ostensible Instagram post designed to encourage social, individual, or no learning. We then measured participants implicit and explicit attitudes to see if they aligned with the posts they viewed.

Results show no statistically significant main effects or interaction of motivation or learning on implicit attitudes. However, an exploratory analysis showed a marginally significant main effect of affiliative motivation on implicit attitudes in the social learning condition. For explicit attitudes, there was no significant main effect of learning or the interaction between learning and motivation. However, explicit attitudes were significantly influenced by the type of motivation. Exploratory analyses showed that epistemic motivation led to more positive attitudes than affiliative and neutral motivation – especially in the social learning conditions. While these results do not fully agree with the hypotheses of the study, they act as indicators of where future researchers can focus their efforts.

Keywords: Affiliative Motivation, Epistemic Motivation, Social Learning, Individual Learning, Social Tuning, Shared Reality, Collective Decision Making

Investigating Motivation and Learning as Factors that Affect Attitude

Research shows that developing a shared reality, or a common inner state (e.g., feeling, judgment, and attitude) about some aspect of the world is an important aspect of interpersonal relationships (Echterhoff et al., 2009; Echterhoff & Schmalbach, 2018). The motivation to create this shared reality is very powerful, as it allows individuals to feel connected to others by knowing they have a shared set of ideas or values. Shared reality is thought to be one of the reasons why individuals engage in social tuning, or aligning their views with an interaction partner, especially if they have the motivation to get along with their interaction partner (e.g., affiliative motivation) or gain knowledge from them (i.e., epistemic motivation; Lun et al., 2007; Sinclair, Huntsinger, et al., 2005; Sinclair, Lowery, et al., 2005). Moreover, research has shown that despite concessions and any differences in the underlying beliefs, attitudes, and viewpoints of individuals, groups will almost always come to an outcome they find satisfactory (Ramazi et al., 2016).

The present study, however, looks at how these outcomes and shared realities are reached on a more individual level. The present study's method of doing this is very similar to that of a 2012 study of FIRST Robotics Competition participants, where Skorinko et al. found that goals, one of which related to academic learning, expressed to individuals had a profound impact on their outcomes. The 2012 study essentially provided participants with an idea of an outcome (in the form of a goal), and then measured the effects these goals had on participants – finding they were able to influence outcomes. The present study takes a different approach and instead provides participants with a set of tools that are predicted to lead to certain outcomes and does not tell the participants what the predicted outcome is. The actual outcomes are then measured to

find which pairings of tools are the most effective. The two factors, or types of “tools,” that this study investigates are motivation (the driving force to reach an outcome) and learning (the effort to achieve an outcome). In certain pairings, these two factors may be able to influence an individual’s attitude (the outcome). Essentially, with the proper motivation and method of learning, an individual may be willing to alter their beliefs/attitudes/viewpoints.

As the present investigation is occurring at the individual level, without any interaction partner(s), social tuning and collective decision-making are not expected to occur. Instead, this study looks to investigate if individuals will align their views with others despite the lack of an imminent interaction partner. Future research will be able to expand upon this by using the findings of this study as a basis to investigate how these pairings of motivation and learning might impact decision-making in situations where more than one individual is involved.

Collective Decision Making

Each decision requires a complex series of steps where the decision maker analyzes different choices, processes information, and then ultimately selects an option (Eilon, 1969). This option, even if chosen by an individual on a seemingly personal topic, can have an impact on others. This means that people are influenced and impacted by decisions, regardless of if it was made by an individual or a group. Given the immense responsibility and influence of decision-making, it makes sense that almost all human societies have relied on groups of individuals, rather than a single individual, to make major decisions for the society (Kerr & Tindale, 2004). These decisions, which typically aim to regulate or establish societal/group behaviours and norms, are known as collective decisions (Seok, 2011).

Collective decisions allow for individuals of differing viewpoints, attitudes, and backgrounds to work together and reach a satisfactory decision for the group as a whole (Ramazi

et al., 2016). In sharing these thoughts and understandings, the group allows for a variety of viewpoints and experiences to be voiced, whereas decisions made by a single individual do not allow for considering the thoughts and ideas of others (Yetton & Bottger, 1982).

Sometimes, making decisions can be an unproductive process where group members are seeking to reach an amicable consensus as fast as possible, without individual input, and often following the lead of the group's leader. This sort of unproductive phenomenon is known as groupthink (Hart, 1991). Despite this, research has shown that groups who engage in the process of collective decisions tend to have better overall group performance than groups where only one person makes decisions for the whole group (Cooke & Kernaghan, 1987; Hamada et al., 2020; Miner, 1984; Yetton & Bottger, 1982). This ultimately leads to the group working together to form a consensus on a shared set of thoughts and understandings, or a shared reality. Ultimately, collective decisions are another way in which shared realities may be created. While we know that individuals will engage in social tuning with a single interaction partner, it is less clear what role, if any, social tuning plays in group settings or collective decision making.

Social Tuning

Social tuning is the process of unconscious alignment of attitudes, both implicit and explicit, with an interaction partner (Davis & Rusbult, 2001; Sinclair, Lowery, et al., 2005). Essentially, people use the thoughts and opinions of other people to help form their own and to make decisions (Echterhoff et al., 2009). This is very similar to the concept of collective decisions, but with an individual aligning their thoughts and ideas with another individual, rather than coming to a consensus with a whole group. Both processes rely on thoughts, ideas, and attitudes being aligned, but differ in terms of how many individuals there are. Given that this process of social tuning takes place between two individuals, prior research has looked at factors,

such as motivation, that might lead these individuals to engage in social tuning. While there will not be an ostensible interaction partner in the present study, using these same factors will show what happens in the absence of a partner.

Types of Motivation

Motivation is expected to play a role regardless of the presence of an interaction partner, as it what drives and explains an individual's behaviours – it is essentially the “why” behind what an individual does (Cook, 2020). As such, there has been a large amount of research into different types of motivation, and when they tend to appear (Guay et al., 2010; Korman, 1974; Reiss, 2012) – though much of this research tends to focus on the overarching categories of intrinsic and extrinsic motivation rather than a specific form. However, previous social tuning research has tended to focus on two specific types of motivation, affiliative motivation and epistemic motivation (Lun et al., 2007; Sinclair, Lowery, et al., 2005), both of which have been shown to lead to engagement in social tuning.

Affiliative motivation comes from the desire to belong to a group or get to know someone and focuses on more social aspects (Sinclair, Lowery, et al., 2005). A review by Skorinko & Sinclair (2018) examined the role of affiliative motivation in the social tuning of implicit prejudices. Their review found that if an individual was motivated to get along with their interaction partner, social tuning was likely to occur, even if the interaction partner's beliefs were prejudiced. Because of the individual's affiliative motivation, the individual was led to create this sense of shared reality with the interaction partner, regardless of any prejudice involved.

Epistemic motivation comes from the desire to learn or understand (Lun et al., 2007; Mesquita et al., 2010). Lun et al. (2007) and Mesquita et al. (2010) explored the role of epistemic motivation in the social tuning of implicit prejudices. The results of these two studies

found that if an individual was motivated to learn and acquire knowledge, social tuning was likely to occur, even if the interaction partner's beliefs were prejudiced. Because of the individual's epistemic motivation, the individual was led to create this sense of shared reality with the interaction partner, regardless of any prejudice involved. However, the way in which an individual learns about their interaction partner's attitudes and beliefs may also affect the individual's attitude, and the creation of a shared reality.

Types of Learning

Learning, as defined by the American Psychological Association's Dictionary of Psychology (n.d.) is the "acquisition of ... information, behaviours, or abilities" via mental organization and retention. While there are many ways to learn, the two types of learning this study investigates are individual and social learning.

Individual learning is when an individual learns about a topic without any social influence, which is why it is also called exploration (Boyd & Richerson, 1988; Tamura et al., 2015). As the individual is "exploring" the topic on their own, they can make their inferences and gain insight entirely based on what they find and/or experience. This type of learning appears to be similar to the central route to persuasion laid out in the elaboration likelihood model. The central route requires the audience to interpret, process, and evaluate the message (Cacioppo & Petty, 1984), just as individual learning as it requires an individual to acquire knowledge on their own and make choices based on an evaluation of different options and the merit of those options.

Social learning is when an individual learns about a topic through observation of others. It essentially relies on an interaction between individuals, where one individual exhibits the information (e.g., thoughts, attitudes, behaviours, facts, etc.) and the other learns the information

through observation, and even imitation (Tamura et al., 2015). For this reason, social learning is also referred to as “exploitation” as the observing individual “exploits” the other individual for their knowledge rather than “exploring” it on their own (Galef & Laland, 2005; Tamura et al., 2015). As such, it is a much lower-effort approach than individual learning and can be equated to the peripheral route in the elaboration likelihood model. Both the peripheral route and social learning are both focus more on the characteristics and emotions of the situation – essentially following the choices of those around them, rather than evaluating, interpreting, or processing the facts and evidence (Bandura & Walters, 1977; Cacioppo & Petty, 1984).

Present Research

Past research shows that the beliefs of an interaction partner and the beliefs of others in a group can influence the likelihood of social tuning, or the group decisions made. However, in the current work, we are interested in what happens when there is no imminent interaction with a partner or a group. More specifically, we investigate whether the motivation to affiliate or to gain knowledge still influences alignment towards a viewpoint because we know that motivations can influence social tuning when there is an ostensible interaction that is going to happen (Beatty et al., 2019; Lun et al., 2007; Mesquita et al., 2010; Sinclair, Lowery, et al., 2005, 2005; Skorinko & Sinclair, 2018). Yet, we also know from past work that individuals do not need an imminent interaction for others’ experiences/beliefs about something (e.g., the goals of a program) to influence their experience (Skorinko, et al., 2012). Thus, the current work will provide information on whether interpersonal motivations are limited to situations where an interaction is imminent.

As such, the second factor being investigated is learning – as to align with another’s attitude, one must first learn about the attitude. This study focuses on both social learning and

individual learning due to their similarities to affiliative motivation and epistemic motivation, as well as their persuasive elements (e.g., central or peripheral cues; Cacioppo & Petty, 1984). Both affiliative motivation and social learning involve an individual connecting with those around them, and individual learning, while epistemic motivation and individual learning involve an individual acting on their own.

Given these similarities between types of motivation and learning, this study investigates how the interaction of these two factors may impact alignment with the presented attitude. Furthermore, this study investigates what role these factors have on attitude alignment in an individual setting. This investigation is achieved through manipulation of the motivation and learning an individual receives, followed by a measurement of their attitudes towards the topic. The two pairings of motivation and learning that are predicted to create the strongest, most significant, attitude shifts are affiliative motivation with social learning and epistemic motivation with individual learning.

Method

Participants

A total of 324 participants in this study were recruited using both an online social science research participation pool at a private university in New England, and a public online crowdsourcing platform. The 5 participants who identified as being attracted to the same gender and/or sex were removed as this study is testing attitudes towards the sexual orientation that they identify. Those who self-identified their sexual orientation as heterosexual (90.61%), bisexual (5.71%), asexual (2.45%), pansexual (0.82%), or omnisexual (0.41%) were not excluded as attitudes towards their sexual orientations was not being measured.

There were 81 participants excluded for various reasons (10 experienced computer errors, 10 did not answer any questions, 27 only partially answered questions, 14 met the exclusion criteria for the SC-IAT, 13 were outliers on measures of implicit and explicit attitudes, and 1 answered the open responses vulgarly), and as such, the results of this study are based on the data of 245 participants. Of those 245 participants, 52.24% identified their gender identity as female, and 47.76% as male. The self-reported ethnicity background is as follows: 77.55% White/Caucasian, 5.31% Black/African American, 5.31% Asian (East Asian, South Asian, Pacific Islander), 4.90% Hispanic/Latino(a), and 6.94% multi-racial. All participants took part voluntarily, freely gave their informed consent, and were debriefed immediately after participation. Participants were compensated with experimental credit for their social science course(s) or a small monetary reward if they participated online.

Design

This study followed a 3 (Motivation: Affiliative Motivation, Epistemic Motivation, Neutral Motivation) x 3 (Learning: Social Learning, Individual Learning, Neutral Learning) between-participants design with explicit and implicit attitudes toward sexual orientation as a dependent measure. The independent variable type of motivation was manipulated using a priming effect that was operationalized with a sentence unscrambling task. One-third of the participants unscrambled sentences that reflected affiliative motivation, one-third unscrambled sentences that reflected epistemic motivation, and the final one-third unscrambled neutral sentences. A full breakdown of these nine conditions can be in Table 1 on the next page.

The independent variable type of learning was manipulated with the type of social media post participants viewed. One-third of participants viewed an Instagram post that was informational in nature, containing a bulleted list of statements that appeared factual, one-third

viewed an Instagram post that focused on social connections and contained no information, and the final one-third viewed a neutral Instagram post that was not connected to the topic of the other two posts.

The dependent variables were participants' implicit and explicit attitudes towards individuals attracted to the same gender and/or sex. The implicit attitudes were measured using the Single Category Implicit Attitude Test (SC-IAT) described in Karpinski & Steinman (2006), but with the stimuli from the sexuality attitude task in Nosek et al. (2007). The explicit attitudes were measured using a 25-item attitude measurement instrument from Falmomir-Pichastor and Mugny (2009)'s study on men's gender, self-esteem, and sexual prejudice.

Materials

Manipulating the Types of Motivation

After providing informed consent, participants were primed to receive either affiliative, epistemic, or neutral motivation. The method of doing this was sentence unscrambling tasks which tasked the participants with forming grammatically correct sentences based on a list of words (e.g., Ball Toss Hoop Silently The = Toss the Ball Silently; Lun et al., 2007). Each of the possible grammatically correct sentences was designed to prompt the participants to want social connection (affiliative motivation), to want knowledge (epistemic knowledge), or a no particular motivation (neutral motivation). The affiliative (Beatty et al., 2019) and neutral (Bargh & Chartrand, 2000) tasks were chosen based on their success in manipulating motivation in previous research, while the epistemic task was designed based on the processes of that prior research.

Affiliative Motivation Task. The affiliative motivation sentence unscrambling task was made up of 16 sentences relating to affiliative motivation (e.g., "She cooperates with me" Beatty

et al., 2019). The task was a computerized version of the one used in the 2019 Beatty et al. study, which was created based on the formatting of the neutral unscrambling task and pretested on a small group of participants. The affiliative motivation sentence unscrambling task can be found in Appendix A.

Epistemic Motivation Task. An epistemic motivation sentence unscrambling task was created for this study. The task consisted of 16 sentences, all of which were related to epistemic motivation (e.g., “I am excited to learn”). This unscrambling task was tested on several participants and was deemed to be associated with epistemic motivation. The procedure of creating this task mirrored the methods of how Beatty et al. (2019) created the affiliative motivation task. The epistemic motivation sentence unscrambling task can be found in Appendix B.

Neutral/No Motivation Task. The neutral motivation task used in this study was a computerized, 16-sentence version of the Bargh & Chartrand (2000) instrument that was used by Beatty et al. (2019). The sentences being unscrambled in this task were neutral (e.g., “Toss the ball silently”) to not prime the participants towards a certain type of motivation. The neutral motivation sentence unscrambling task can be found in Appendix C.

Manipulating the Types of Learning

Social media has become increasingly prevalent in today’s society (Hruska & Maresova, 2020). This makes sense as it allows individuals, and organizations, to easily communicate with people all over the world (Khan et al., 2021; Klinger & Russmann, 2017), and even provides a virtual environment to learn (Barrot, 2021). With this in mind, social media posts were used to manipulate the type of learning participants experience. Instagram posts were specifically chosen as they allow for the use of different images as stimuli.

A set of three Instagram posts against a recent controversial bill, Florida's Parental Rights in Education Bill (PREB), were created. One of the three posts was social in nature (see below), the second was informational in nature (see below), and the third was designed to be neutral (see below). The posts were then inserted into a visual of an Instagram feed to make them more believable. Comments, usernames, and profile pictures were all blurred out to prevent distraction and limit confounds. The three posts were then pretested with a series of questions to determine the overall tone and attitude of each post, how informational it felt, and how much connection it elicited. The pre-test had a total of 10 participants and indicated that the informational post was the most informational, the social post elicited the most connection, and the neutral post did neither. While the three Instagram posts had similar overall tones, the informational and social posts were slightly more negative in tone. However, given the topic and demographics of the pre-test participants, that was deemed acceptable.

Social Learning Post. The social learning post (found in Appendix D) focused on the people involved, as it was meant to elicit a feeling of social connection and peripheral cues about the topic without providing detailed information. Therefore, a photo of a protest was used as it showed what the protesters were gathered for, without providing detailed information on the topic. This meant the signs did not have any informational content on them, meaning they either used catchphrases such as "It's OK to say GAY!" or encouraged a no vote on the bill. In addition to focusing on people, the social learning post included a short catchphrase for a title that imitated the language of the protester's signs, warning of the PREB's consequences. A generic background colour was chosen to be usable on all three posts while not distracting from the content of the image or creating confounds.

Individual Learning Post. The individual learning post (found in Appendix E) focused on the facts, or perceived facts, involved in the topic, as they were meant to be informative with little to no feelings of social connection. To remove this sense of connection, the post was a bulleted list of four perceived facts either in support of or against the PREB. Important phrases within the bullets were underlined. The colour scheme and background of the post matched those of the social learning post and neutral post. The short catchphrase title took up the same amount of space as the one in the social learning post but had different wording that was focused on informing about the goals or consequences of the PREB.

Neutral Post. The neutral post (found in Appendix F) focused on neither informational content nor social connections. Instead, it featured a generic photo of food with the caption “New Recipe Available!” There were no people or pieces of information present in the post.

Social Media Post Related Questions

To increase believability that the study was about social media posts and not just attitudes towards a group, participants completed a 9-question survey about the Instagram post that they viewed (found in Appendix G). This survey was administered right before the Single-Category Implicit Attitude and not only supported the cover story but encouraged the participants to think about the post they saw. The questions in the survey were replicated from the pre-test used to determine which Instagram posts would be used in the study and scored on a seven-point Likert scale (1=Strongly Disagree, 7=Strongly Agree). Questions touched on the following categories: clarity (e.g., "The post I saw had clear messaging."), informativeness, persuasiveness (e.g., "The post I saw was persuasive."), feelings of connection, and agreement (e.g., "I agree with the content of the post I saw."). These questions were intended as filler questions to aid in supporting the study's cover story.

Single Category Implicit Attitude Test (SC-IAT)

As this study is investigating the connections between pairings of motivation and learning and an individual's shift in attitudes, participants' implicit attitudes toward individuals attracted to the same gender/sex were measured using a Single Category IAT (SC-IAT). An SC-IAT was chosen as it is a modification of the regular IAT which only measures the strength of associations with a single attitude instead of two (Karpinski & Steinman, 2006). This meant that instead of measuring attitudes toward both individuals attracted to the same gender and/or sex and individuals attracted to the opposite gender and/or sex, only attitudes toward individuals attracted to the same gender and/or sex were captured. The higher, and more positive, score a participant received on the SC-IAT indicated more favorable attitudes towards individuals attracted to the same gender and/or sex, whereas a lower, more negative, score indicated more negative attitudes.

The SC-IAT used in this study was an adaptation of Project Implicit's Sexuality IAT (Nosek et al., 2007), with the heterosexual attitude portion removed. The stimuli consisted of eight generic illustrations that portrayed same-gender couples, and 42 words, half of which were associated with the word "Good", and half associated with the word "Bad." In this SC-IAT, participants categorized photos of same-gender couples, "good" words (e.g., "marvelous," "happy," "splendid") and "bad" words (e.g., "gross," "noxious," "horrible") as either "Good" or "Bad."

Before taking the SC-IAT, the participants were informed that they needed to categorize the stimuli as fast and accurately as possible. They were instructed to press the "e" key if the stimulus fit in the left category, and the "i" key if it fit in the right category. There were four rounds of categorization, two practice trial rounds, and two test trial rounds. In "Round A," participants had a practice round to categorize the stimuli as either "Good/Homosexual" or

“Bad” (these category anchors were taken from the Sexual Orientation IAT in Nosek et al., 2007) “Round B” was the same, however, was the actual test trial. “Round C,” the second test round, flipped the location of “Homosexual” and had participants categorize the stimuli as either Good or Bad/Homosexual. “Round D” was identical but was the actual test trial. To avoid potential bias, the rounds were counterbalanced, with participants randomly being assigned to one of two groups. Participants in group 1 saw the rounds in the order above, and those in group 2 saw Rounds C and D followed by Rounds A and B.

Explicit Scales

Following the SC-IAT, participants’ explicit attitudes towards individuals who are attracted to the same sex and/or gender were measured using a computerized version of the 25-item Attitudes Towards Homosexuality Scale. This scale was developed by Falomir-Pichastor & Mugny (2009) to assess attitudes across a range of dimensions. The scale includes new items as well as items adapted from previously developed measurements (Herek, 1988; Morrison & Morrison, 2002). Some of these new items grouped together gay men and lesbian women, rather than asking separate questions about each group, while others replaced negatively framed questions regarding sexual orientation.

The Falomir-Pichastor & Mugny scale (found in Appendix H) asks participants to indicate how much they agree with a statement on a 7-point Likert scale (1=Strongly Disagree, 7=Strongly Agree). The statements are designed to fit into one of the following categories: morality (e.g., “Homosexuality is contrary to the values of the family”), feelings (e.g., “I feel sympathy for homosexuals”), civil rights (e.g., “Homosexual couples should have the right to adopt children”), and acceptance of contact (e.g., “I would not mind having a gay or lesbian work colleague.”).

To assess the attitudes, the numerical rating of each statement (nine of which are reverse scored – so Strongly Disagree corresponds to 7 instead of 1) is added together and then divided by the number of statements. Final calculations that are closer to 7 indicate positive attitudes toward individuals who are attracted to the same gender and/or sex, while ones closer to 1 indicate negative attitudes toward those individuals.

Procedure

In-person participants were welcomed into the lab, sat at a computer, read an informed consent, and indicated agreement to participate. Online participants selected the study from a pool of possible studies, read an informed consent, and indicated agreement to participate. Participants who agreed to participate then learned the cover story, which was that the study examined the impact that social media had on an individual's cognitive performance. To do that, they were told they would complete a baseline test, review some social media posts, answer some questions, and complete a cognitive task.

After hearing the cover story, participants believed we needed to measure their baseline cognitive performance which was the sentence unscrambling task. Participants were randomly assigned to unscramble sentences that were related to affiliative motivation (e.g., “She cooperates with me”), related to epistemic motivation (e.g., “I am excited to learn”), or neutral (e.g., “Toss the ball silently”).

Following the unscrambling task, participants viewed a social media post, answered some questions about it, and then completed an ostensible cognitive assessment. The social media post manipulated the type of learning they engaged with. Participants were randomly assigned to either view the social learning post, the individual learning post, or the neutral post. The social and individual learning posts were designed to evoke attitudes of support for individuals

attracted to the same gender and/or sex. This was done by portraying either anti-PREB protesters (social learning) or a bulleted list of consequences of the PREB (individual learning). The questions about the post were a series of 9 questions related to the post the participant viewed. These questions were related to the following categories: clarity, informativeness, persuasiveness, feelings of connection, and agreement. The cognitive assessment participants completed next was an SC-IAT (adapted from Karpinski & Steinman, 2006; Nosek et al., 2007). This SC-IAT was used to measure their implicit attitudes toward individuals attracted to the same gender and/or sex.

After that, participants answered a 25-item attitude measure developed by Falomir-Pichastor & Mugny (2009). Finally, participants provided demographic information (i.e., gender identity, sexual orientation, ethnicity, age, education level, and means of participation). Once they were done answering, all participants were thanked for their time and participation and were fully debriefed on the purpose and procedures of the study. The debriefing was provided verbally and on the computer screen for in-person participants, and just on the screen for online participants.

Results

The data were assessed for statistical significance at $\alpha = .05$ and were analyzed using a series of ANOVA tests. The types of learning and types of motivation were the between-participants factors, and the types of attitudes were the dependent measures. We predicted that the two pairings of motivation and learning that most likely to create an attitude alignment are affiliative motivation with social learning and epistemic motivation with individual learning – which ended up being partially incorrect.

Implicit Attitudes

There were no statistically significant main effects for the type of motivation ($F(1, 235) = 0.87, p = .42, \eta_p^2 = .01$) or the type of learning ($F(2, 235) = 0.47, p = .63, \eta_p^2 = .00$), nor was there an interaction between the two ($F(4, 235) = 1.29, p = .28, \eta_p^2 = .021$) on implicit attitudes. While there were no significant results, we conducted two exploratory analyses to look at the results based on the type of motivation and the type of learning to get a more comprehensive understanding of the data.

Exploratory Look at Effects Based on Types of Motivation on Implicit Attitudes

To conduct these exploratory analyses, we conducted separate Univariate ANOVAs for each motivation condition (e.g., affiliative, epistemic, and neutral) to analyze the effect of motivation based on the type of learning. When participants were primed with epistemic motivation ($N = 91, M = .13, SD = .31$), there were no significant differences in implicit attitudes towards individuals attracted to the same gender and/or sex based on the types of learning (e.g., social, individual, or neutral), ($F(2, 88) = 0.09, p > .68, \eta_p^2 = .00$). There were also no effects for affiliative motivation ($N = 67, M = .13, SD = .33$) based on the types of learning, ($F(2, 64) = 2.14, p > .07, \eta_p^2 = .06$) or for the neutral motivation ($N = 86, M = .07, SD = .34$) based on the types of learning, ($F(2, 83) = 0.61, p > .31, \eta_p^2 = .01$).

Exploratory Look at the Effects Based on Types of Learning on Implicit Attitudes

We also conducted an exploratory analysis using separate Univariate ANOVAs for each learning condition (e.g., social, individual, and neutral) to analyze the effect of learning based on motivation. When participants saw the individual learning ($N = 76, M = .09, SD = .34$) post (e.g., the one with facts), the types of motivation did not influence their implicit attitudes towards individuals attracted to the same gender and/or sex, ($F(2, 73) = 1.02, p > .16, \eta_p^2 = .03$). There

were also no effects of the types of motivation in the neutral learning ($N = 78$, $M = .13$, $SD = .32$) condition (e.g., the recipe post), ($F(2, 75) = 0.44$, $p > .31$, $\eta_p^2 = .01$). Within the social learning ($N = 90$, $M = .11$, $SD = .33$) condition (e.g., protest image), the only significant difference ($F(2, 87) = 2.05$, $p = .55$, $\eta_p^2 = .05$) was that those who had affiliative motivation ($M = 0.19$; $SD = .34$) tended to endorse the more positive attitudes than those who had neutral motivation ($M = 0.16$; $SD = 0.34$).

Explicit Attitudes

Overall, there were no main effect of the type of learning ($F(2, 234) = 0.14$, $p = .87$, $\eta_p^2 = .00$) nor was there an interaction between the between type of learning and motivation ($F(4, 235) = 0.46$, $p = .76$, $\eta_p^2 = .01$) on explicit attitudes. However, the type of motivation did have a significant main effect on explicit attitudes ($F(2, 235) = 3.78$, $p = .02$, $\eta_p^2 = .03$). A post-hoc analysis revealed that participants who were primed with epistemic motivation ($N = 91$, $M = 5.89$, $SD = .16$) showed significantly more positive attitudes ($F(2, 241) = 4.04$, $p = .01$, $\eta_p^2 = .03$) than those primed with affiliative motivation ($N = 67$, $M = 5.253$, $SD = .18$). Likewise, those who received epistemic motivation ($N = 91$, $M = 5.89$, $SD = .16$) showed significantly more positive ($F(2, 241) = 4.04$, $p = .04$, $\eta_p^2 = .03$) results than those who received neutral motivation ($N = 86$, $M = 5.534$, $SD = .16$). To get a more comprehensive understanding of the data, we conducted two exploratory analyses to look at the results based on the type of motivation and the type of learning.

Exploratory Look at Effects Based on Types of Motivation on Explicit Attitudes

The first exploratory analyses were conducted through separate Univariate ANOVAs for each of the motivation conditions (e.g., affiliative, epistemic, and neutral) in order to see the effects of motivation based on the type of learning (e.g., social, individual, or neutral).

Participants who were primed with affiliative motivation ($N = 67$, $M = 5.253$, $SD = .18$) showed no significant differences in explicit attitudes towards individuals attracted to the same gender and/or sex based on the types of learning, ($F(2, 64) = .24$, $p > .52$, $\eta_p^2 = .01$). Likewise, there were no differences for neutral motivation ($N = 86$, $M = 5.534$, $SD = .16$), ($F(2, 83) = .48$, $p > .37$, $\eta_p^2 = .01$). and epistemic motivation ($N = 91$, $M = 5.89$, $SD = .16$) based on the types of learning, ($F(2, 88) = .32$, $p > .44$, $\eta_p^2 = .01$).

Exploratory Look at Effects Based on Types of Learning on Explicit Attitudes

We conducted another exploratory Univariate ANOVA analysis to identify possible effects of learning based on types of motivation. When viewing the individual learning post (e.g., the one with facts), participants' explicit attitudes towards individuals attracted to the same gender and/or sex were not influenced by the types of motivation, ($F(2, 73) = 1.91$, $p > .06$, $\eta_p^2 = .05$). Likewise, the types of motivation did not have any effects for the neutral learning post (e.g., the recipe post), ($F(2, 75) = .56$, $p > .37$, $\eta_p^2 = .02$). However, the types of motivation did matter for the social learning post (e.g., protest image). Social learning participants who received epistemic motivation ($N = 36$, $M = 5.98$, $SD = 1.04$) took on more positive attitudes towards individuals attracted to the same gender and/or sex than those who received affiliative motivation ($N = 23$, $M = 5.13$, $SD = 1.92$, $F(2, 87) = 2.51$, $p = .05$, $\eta_p^2 = .05$). An additional Univariate ANOVA analysis was conducted to see if there was any difference in effect between the learning conditions. This analysis found that there no significant differences between learning conditions, $p > .69$.

General Discussion

The analyses of this study's data showed that the hypotheses that the pairings of affiliative motivation with social learning and epistemic motivation with individual learning

would lead to alignment for implicit and explicit attitudes – are only partially correct. For implicit attitudes, affiliative motivation and social learning increased the likelihood of an individual aligning their views with the social media post – which confirms this particular hypothesis, and aligns with prior research’s findings that affiliative motivation can lead to implicit attitude alignment (Sinclair, Lowery, et al., 2005). However, this did not occur with epistemic motivation and individual learning for implicit attitudes. For explicit attitudes, the results were contrary to the hypothesis as epistemic motivation and social learning increased the likelihood an individual would align their views with the social media post.

We conducted exploratory analyses to understand what, if anything, occurred for the different types of motivations. This exploratory analysis for explicit attitudes found significant differences in the influence of motivation. Participants who were primed with epistemic motivation endorsed more positive attitudes than those who were primed with either affiliative motivation or neutral motivation. This indicates that motivation may have different amounts of influence on implicit attitudes than it does explicit attitudes – but further investigation is required to confirm this.

This finding aligns with what prior research on attitudes has found: that, to some degree, the differences in explicit and implicit attitudes are expected. For instance, Nosek (2007) identifies several interpersonal (between individuals; such as self-presentation) and intrapersonal (within one’s own mind; such as amount of personal experience) factors that play different roles in influencing the two types of attitudes. Nosek, echoing Banaji et al. (2004), identifies accumulated lived experience (or culture; Deng et al., 2019) as another potential factor. These lived experiences are often something that individuals often do not consciously think about – yet

the experiences may still influence their perceptions. This leads us to the idea that implicit attitudes require more information, built up from past experiences, to be significantly influenced.

A paper by Rydell et al. (2007), investigating the responses of implicit and explicit attitudes to counterattitudinal information, furthers this idea and provides insight into explicit attitudes. They found that explicit attitudes changed quickly in response to information that was inconsistent with that attitude, whereas implicit attitudes were slow to change. Coupled with the results of this study, an interesting dynamic begins to emerge. Based on the findings of Rydell and colleagues (2007), we should expect that in conditions where little counterattitudinal information is presented, in this case the social learning condition, that explicit attitudes should be more likely to change – and they did. However, for implicit attitudes, where one would expect that conditions with more counterattitudinal information being presented, such as the individual learning condition, that implicit attitudes would be more likely to change due to more time being spent on learning a greater amount of information– but they did not. Interestingly, they were observed to be changed by the social learning condition.

A possible reason for this may have been the participants' prior experiences with individuals who are attracted to the same gender and/or sex – something the current study did not factor in. This means that potentially, individuals who have had extremely positive past experiences will likely be more willing to adopt a positive attitude – while those with negative past experiences may take more counterattitudinal information to adopt a positive attitude. Future research that does this, potentially by asking about this in the demographics, may help explore if past experiences are the most significant factor, or if there are cases where motivation and/or learning are significantly more influential.

This also highlights a few potential limitations of this study – namely the attitude being tested and the medium of the social media posts. Participants who were not in a neutral learning condition only viewed social media posts that echoed a pro-LGBTQIA+, anti-PREB, attitude – none viewed posts that promoted an anti- LGBTQIA+, pro-PREB, attitude. Moreover, these posts took a relatively negative tone – presenting information about the consequences of the PREB. These both become limitations when considering that both the message and the tone of the post may also be influencing attitude alignment.

It is important to note, however, that both pro- LGBTQIA+/anti-PREB and anti-LGBTQIA+/pro-PREB were pretested for this study. The anti-PREB posts were chosen as the pretest results showed that their information was clearer, more believable, and better aligned to the types of learning being manipulated. The negative tone of the selected post was deemed acceptable due to the demographics of pre-test participants (many identified as LGBTQIA+) and the harmful nature of the bill in question (Johnson, 2022). Meanwhile, the difference in tones between the pro-PREB posts and the anti-PREB posts was associated with general confusion about and misrepresentation of the bill by American media and politicians (Carlisle, 2022; Izaguirre & Licon, 2022; Voght, 2022). While further research investigating the potential impacts of tone and the attitude being presented could be greatly beneficial – it does raise ethical questions as to whether researchers should be trying to make individuals more negative towards others.

Similar to message and tone, the medium of an Instagram post is only one form of social media post. Testing a variety of social media post mediums (e.g., videos, text, multiple slides of text/images, etc.) presented on different social media platforms (e.g., Facebook, Twitter, TikTok, Reddit, etc.) may help to eliminate any confounds in this study's results and see if the platform

really matters. This is due to the difference in interaction patterns and audiences between different types of platforms, which has been shown to play a pivotal role in how information is spread and learned (Cinelli et al., 2020).

Another benefit to testing different mediums on different platforms stems from the fact that individuals have different motivations and reasons to use certain platforms. A 2021 study investigated the effects of Facebook, Instagram, TikTok, and Twitter on individual's well-being, and found that not only is there a specific reason for using a given platform, but there are also different types of communication and information exchanges happening between platforms (Masciantonio et al., 2021). As an example, Instagram was found to be the most popular platform for individuals to look for information-based content (individual learning) and for more personal content (social learning). Meanwhile, Twitter was found to be used to find mostly information-based content.

Incorporating different mediums and platforms into future research will help to distinguish if those factors truly matter in terms of influencing attitudes. However, testing a variety of platforms and mediums leads to several challenges, hence why the present study focuses on Instagram posts. Among these challenges is accounting for potential confounds, such as the amount of information being presented. For example, researchers will have to make sure that if one set of participants watches a YouTube video while another reads a Facebook post, that both receive the same amount of information in those interactions. Given the size and scale of this study, it was not possible to include all of those factors – though future research that is able to will help to explore the potential influences they may have on attitude alignment.

Future research addressing these limitations will be able to do more than just explore the influence of different factors on attitude alignment. The present study addresses what happens on

an individual level, when there is no imminent interaction partner. However, introducing an interaction partner, or a group of interaction partners, would allow for the exploration of if, and how, the results of this study, as well as the limiting factors addressed above, play out in processes like social tuning and collective decision making.

Supporting this, both social tuning and collective decision-making ultimately deal with individuals aligning their thoughts, ideas, and attitudes to create a shared reality. As such, any investigation of factors that may affect how individuals come to this alignment increases our understanding of social tuning and collective decision-making. While the current study only investigated these effects on an individual level, it does provide a steppingstone for research where more than one individual is present.

References

- American Psychological Association. (n.d.). Learning. In *APA dictionary of psychology*. Retrieved October 27, 2022, from <https://dictionary.apa.org/>
- Banaji, M. R., Nosek, B. A., & Greenwald, A. G. (2004). No place for nostalgia in science: A response to Arkes and Tetlock. *Psychological Inquiry*, 15(4), 279–289.
- Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Englewood Cliffs: Prentice Hall.
- Bargh, J. A., & Chartrand, T. L. (2000). The mind in the middle: A practical guide to priming and automaticity research. In *Handbook of research methods in social and personality psychology*. (pp. 253–285). Cambridge University Press.
- Barrot, J. S. (2021). Social media as a language learning environment: A systematic review of the literature (2008-2019). *Computer Assisted Language Learning*, 1–29. <https://doi.org/10.1080/09588221.2021.1883673>
- Beatty, P. T., Vega, D. J., & Perez Lacera, L. M. (2019). *The motivations of social tuning: Perspective taking and affiliative motivation*. Worcester Polytechnic Institute. <https://digital.wpi.edu/show/8336h456w>
- Boyd, R., & Richerson, P. J. (1988). *Culture and the evolutionary process*. University of Chicago Press. <https://press.uchicago.edu/ucp/books/book/chicago/C/bo5970597.html>
- Cacioppo, J. T., & Petty, R. E. (1984). The elaboration likelihood model of persuasion. *Advances in Consumer Research*, 11, 673–675.
- Carlisle, M. (2022, August 25). *LGBTQ teachers struggle to navigate Florida’s so-called “Don’t Say Gay” law*. Time. <https://time.com/6208554/florida-lgbtq-teachers-dont-say-gay-education-law/>

- Cinelli, M., Quattrocioni, W., Galeazzi, A., Valensise, C. M., Brugnoli, E., Schmidt, A. L., Zola, P., Zollo, F., & Scala, A. (2020). The COVID-19 social media infodemic. *Scientific Reports*, 10(1), Article 1. <https://doi.org/10.1038/s41598-020-73510-5>
- Cook, K. (2020). Motivation. In K. Cook (Ed.), *The Psychology of Silicon Valley: Ethical Threats and Emotional Unintelligence in the Tech Industry* (pp. 95–122). Springer International Publishing. https://doi.org/10.1007/978-3-030-27364-4_5
- Cooke, R. A., & Kernaghan, J. A. (1987). Estimating the difference between group versus individual performance on problem-solving tasks. *Group & Organization Studies*, 12(3), 319–342. <https://doi.org/10.1177/105960118701200307>
- Davis, J. L., & Rusbult, C. E. (2001). Attitude alignment in close relationships. *Journal of Personality and Social Psychology*, 81, 65–84. <https://doi.org/10.1037/0022-3514.81.1.65>
- Deng, X., An, S., & Cheng, C. (2019). Cultural differences in the implicit and explicit attitudes toward emotion regulation. *Personality and Individual Differences*, 149, 220–222. <https://doi.org/10.1016/j.paid.2019.05.057>
- Echterhoff, G., Higgins, E. T., & Levine, J. M. (2009). Shared reality: Experiencing commonality with others' inner states about the world. *Perspectives on Psychological Science*, 4(5), 496–521. <https://doi.org/10.1111/j.1745-6924.2009.01161.x>
- Echterhoff, G., & Schmalbach, B. (2018). How shared reality is created in interpersonal communication. *Current Opinion in Psychology*, 23, 57–61. <https://doi.org/10.1016/j.copsyc.2017.12.005>
- Eilon, S. (1969). What is a decision? *Management Science*, 16(4), B172–B189.

- Falomir-Pichastor, J. M., & Mugny, G. (2009). “I’m not gay. . . . I’m a real man!”: Heterosexual men’s gender self-esteem and sexual prejudice. *Personality and Social Psychology Bulletin*, 35(9), 1233–1243. <https://doi.org/10.1177/0146167209338072>
- Galef, B. G., & Laland, K. N. (2005). Social learning in animals: Empirical studies and theoretical models. *BioScience*, 55(6), 489–499. [https://doi.org/10.1641/0006-3568\(2005\)055\[0489:SLIAES\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2005)055[0489:SLIAES]2.0.CO;2)
- Guay, F., Chanal, J., Ratelle, C. F., Marsh, H. W., Larose, S., & Boivin, M. (2010). Intrinsic, identified, and controlled types of motivation for school subjects in young elementary school children. *British Journal of Educational Psychology*, 80(4), 711–735. <https://doi.org/10.1348/000709910X499084>
- Hamada, D., Nakayama, M., & Saiki, J. (2020). Wisdom of crowds and collective decision-making in a survival situation with complex information integration. *Cognitive Research: Principles and Implications*, 5(1), 48. <https://doi.org/10.1186/s41235-020-00248-z>
- Hart, P. (1991). Irving L. Janis’ Victims of Groupthink. *Political Psychology*, 12(2), 247–278. JSTOR. <https://doi.org/10.2307/3791464>
- Herek, G. M. (1988). Heterosexuals’ attitudes toward lesbians and gay men: Correlates and gender differences. *Journal of Sex Research*, 25, 451–477. <https://doi.org/10.1080/00224498809551476>
- Hruska, J., & Maresova, P. (2020). Use of social media platforms among adults in the United States—Behavior on social media. *Societies*, 10(1), Article 1. <https://doi.org/10.3390/soc10010027>

- Izaguirre, A., & Licon, A. G. (2022, August 15). “Don’t Say Gay” law brings worry, confusion to Florida schools. PBS NewsHour. <https://www.pbs.org/newshour/education/dont-say-gay-law-brings-worry-confusion-to-florida-schools>
- Johnson, M. (2022). The dangerous consequences of Florida’s “Don’t Say Gay” bill on LGBTQ+ youth in Florida. *Georgetown Journal of Gender and the Law*, *XXIII*(3). <https://www.law.georgetown.edu/gender-journal/the-dangerous-consequences-of-floridas-dont-say-gay-bill-on-lgbtq-youth-in-florida/>
- Karpinski, A., & Steinman, R. B. (2006). The single category implicit association test as a measure of implicit social cognition. *Journal of Personality and Social Psychology*, *91*(1), 16–32. <https://doi.org/10.1037/0022-3514.91.1.16>
- Kerr, N. L., & Tindale, R. S. (2004). Group performance and decision making. *Annual Review of Psychology*, *55*, 623–655. <https://doi.org/10.1146/annurev.psych.55.090902.142009>
- Khan, M. N., Ashraf, M. A., Seinen, D., Khan, K. U., & Laar, R. A. (2021). Social media for knowledge acquisition and dissemination: The impact of the COVID-19 pandemic on collaborative learning driven social media adoption. *Frontiers in Psychology*, *12*. <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.648253>
- Klinger, U., & Russmann, U. (2017). “Beer is more efficient than social media”—Political parties and strategic communication in Austrian and Swiss national elections. *Journal of Information Technology & Politics*, *14*(4), 299–313. <https://doi.org/10.1080/19331681.2017.1369919>
- Korman, A. K. (1974). *The psychology of motivation* (pp. x, 291). Prentice-Hall.

- Lun, J., Sinclair, S., Whitchurch, E. R., & Glenn, C. (2007). (Why) do I think what you think? Epistemic social tuning and implicit prejudice. *Journal of Personality and Social Psychology, 93*(6), 957–972. <https://doi.org/10.1037/0022-3514.93.6.957>
- Masciantonio, A., Bourguignon, D., Bouchat, P., Balty, M., & Rimé, B. (2021). Don't put all social network sites in one basket: Facebook, Instagram, Twitter, TikTok, and their relations with well-being during the COVID-19 pandemic. *PLOS ONE, 16*(3), e0248384. <https://doi.org/10.1371/journal.pone.0248384>
- Mesquita, B., Barrett, L. F., & Smith, E. R. (2010). *Social Tuning of Ethnic Attitudes*. Guilford Press.
- Miner, F. C. (1984). Group versus individual decision making: An investigation of performance measures, decision strategies, and process losses/gains. *Organizational Behavior and Human Performance, 33*(1), 112–124. [https://doi.org/10.1016/0030-5073\(84\)90014-X](https://doi.org/10.1016/0030-5073(84)90014-X)
- Morrison, M. A., & Morrison, T. G. (2002). Development and validation of a scale measuring modern prejudice toward gay men and lesbian women. *Journal of Homosexuality, 43*(2), 15–37. https://doi.org/10.1300/j082v43n02_02
- Nosek, B. A. (2007). Implicit–Explicit Relations. *Current Directions in Psychological Science, 16*(2), 65–69. <https://doi.org/10.1111/j.1467-8721.2007.00477.x>
- Nosek, B. A., Smyth, F. L., Hansen, J. J., Devos, T., Lindner, N. M., Ranganath, K. A., Smith, C. T., Olson, K. R., Chugh, D., Greenwald, A. G., & Banaji, M. R. (2007). Pervasiveness and correlates of implicit attitudes and stereotypes. *European Review of Social Psychology, 18*(1), 36–88. <https://doi.org/10.1080/10463280701489053>

- Ramazi, P., Riehl, J., & Cao, M. (2016). Networks of conforming or nonconforming individuals tend to reach satisfactory decisions. *Proceedings of the National Academy of Sciences*, 113(46), 12985–12990. <https://doi.org/10.1073/pnas.1610244113>
- Reiss, S. (2012). Intrinsic and extrinsic motivation. *Teaching of Psychology*, 39(2), 152–156. <https://doi.org/10.1177/0098628312437704>
- Rydell, R. J., McConnell, A. R., Strain, L. M., Claypool, H. M., & Hugenberg, K. (2007). Implicit and explicit attitudes respond differently to increasing amounts of counterattitudinal information. *European Journal of Social Psychology*, 37(5), 867–878. <https://doi.org/10.1002/ejsp.393>
- Seok, B. (2011). Collective decision problem. In D. K. Chatterjee (Ed.), *Encyclopedia of Global Justice* (pp. 155–156). Springer Netherlands. https://doi.org/10.1007/978-1-4020-9160-5_141
- Sinclair, S., Huntsinger, J., Skorinko, J., & Hardin, C. D. (2005). Social tuning of the self: Consequences for the self-evaluations of stereotype targets. *Journal of Personality and Social Psychology*, 89, 160–175. <https://doi.org/10.1037/0022-3514.89.2.160>
- Sinclair, S., Lowery, B. S., Hardin, C. D., & Colangelo, A. (2005). Social tuning of automatic racial attitudes: The role of affiliative motivation. *Journal of Personality and Social Psychology*, 89, 583–592. <https://doi.org/10.1037/0022-3514.89.4.583>
- Skorinko, J., Doyle, J., & Tryggvason, G. (2012). Do goals matter in engineering education? An exploration of how goals influence outcomes for FIRST robotics participants. *Journal of Pre-College Engineering Education Research (J-PEER)*, 2(2). <https://doi.org/10.5703/1288284314867>

Skorinko, J., & Sinclair, S. (2018). Shared reality through social tuning of implicit prejudice.

Current Opinion in Psychology, 23, 109–112.

<https://doi.org/10.1016/j.copsyc.2018.02.011>

Tamura, K., Kobayashi, Y., & Ihara, Y. (2015). Evolution of individual versus social learning on social networks. *Journal of The Royal Society Interface*, 12(104), 20141285.

<https://doi.org/10.1098/rsif.2014.1285>

Voght, K. (2022, July 1). Florida's "Don't Say Gay" law took effect. Chaos ensued. *Rolling Stone*. <https://www.rollingstone.com/politics/politics-news/florida-dont-say-gay-law-educators-1377353/>

Yetton, P. W., & Bottger, P. C. (1982). Individual versus group problem solving: An empirical test of a best-member strategy. *Organizational Behavior and Human Performance*, 29(3), 307–321. [https://doi.org/10.1016/0030-5073\(82\)90248-3](https://doi.org/10.1016/0030-5073(82)90248-3)

Appendix A

Affiliative Motivation Sentence Unscrambling Task

Sentence Unscrambling Task

For each set of words below, make a grammatical sentence and type it in the space provided.

For example: Flew eagle the plane around

Solution: The eagle flew around.

1. I to her get along considered wanted with
2. envy I life outlook Rachel's
3. Peter him boss wants like to his candy
4. I want Joey to know guess
5. want I to email to her get know
6. maintain others I get along to with want
7. salad Jackson with Jason affiliates
8. want be like together I with friends to
9. likes Joe really going Sam
10. birds she with me cooperates
11. I blimp interact with want to him
12. know she traveled wanted him to
13. Lisa friend Mary's wants story to be
14. Lauren likes bad cooking with Frank
15. to Sally be Harry wants with style
16. bond I with him picture want to

Appendix B

Epistemic Motivation Sentence Unscrambling Task

Sentence Unscrambling Task

For each set of words below, make a grammatical sentence and type it in the space provided.

For example: Flew eagle the plane around

Solution: The eagle flew around.

1. learn am dog excited I to
2. want understand pictures to I
3. topic me although fascinates that
4. important is balloon her to learning
5. more wants he cats learn to
6. is frogs seeking he knowledge
7. new learns information bridge she
8. to need find pink more out
9. does research a lot shoe he of
10. she motivated table learn to is
11. to more know I towel want
12. interesting is the shirt information
13. learn more none he wait cannot to
14. fun research is alphabet doing
15. learning mirror I enjoy
16. interesting new are backpack perspectives

Appendix C

Neutral Sentence Unscrambling Task

Sentence Unscrambling Task

For each set of words below, make a grammatical sentence and type it in the space provided.

For example: Flew eagle the plane around

Solution: The eagle flew around.

1. ball throws toss silently the
2. he observes occasionally people watches
3. ate she it selfishly all
4. prepare the gift wrap neatly
5. the push wash frequently clothes
6. somewhat prepared I was refer
7. "picked throw apples hardly the"
8. "they obedient him often meet"
9. "helpless it hides over there"
10. "send I mail it over"
11. "a smile what parrot great"
12. "ball the hoop toss normally"
13. "saw hammer the train he"
14. "maintain she to composure try"
15. "the machine wash frequently clothes"
16. "sky the seamless red is"

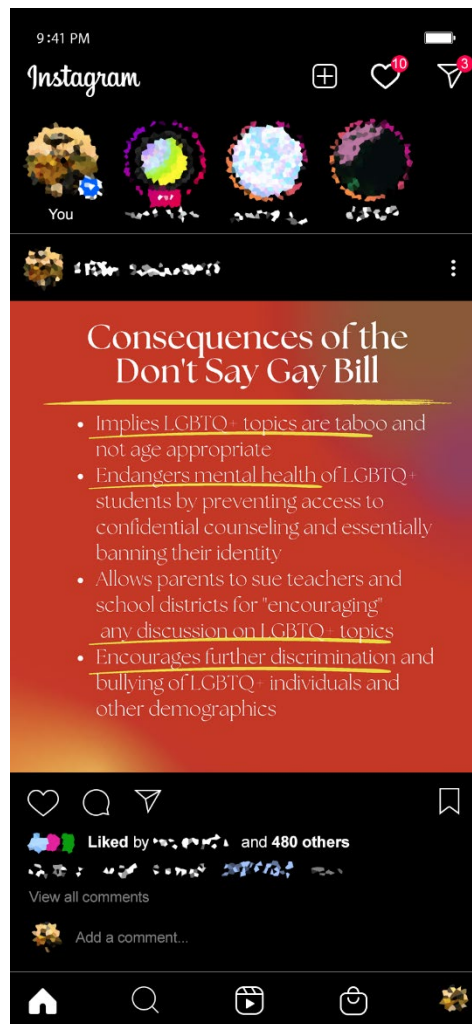
Appendix D

Social Learning Instagram Post



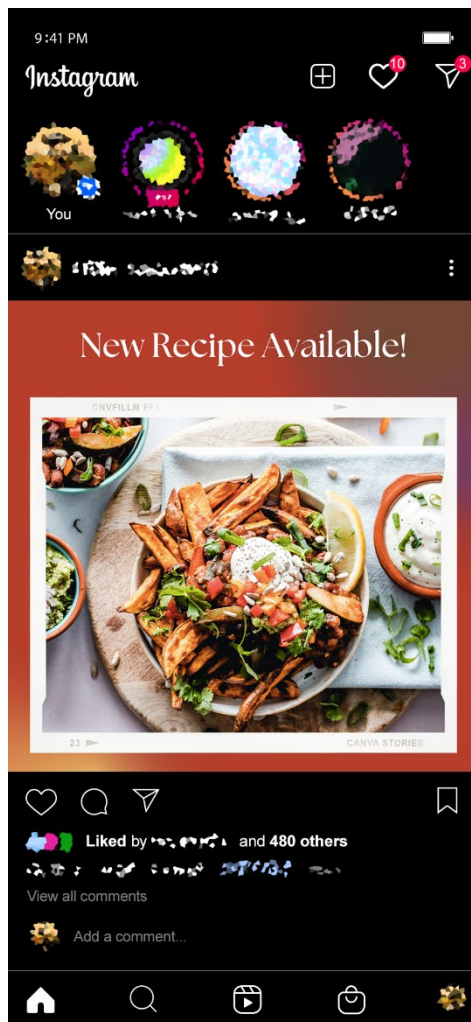
Appendix E

Individual Learning Instagram Post



Appendix F

Neutral Learning Instagram Post



Appendix G

Questions Related to Instagram Post

Please indicate how much you agree with the following statements. There are no right or wrong answers, so please answer as openly and thoughtfully as you can.

Please use the following scale in response to the items below.

1 (Strongly Disagree) - 7 (Strongly Agree)

1. The post I saw had clear messaging.
2. The post I saw was informative.
3. The post I saw was persuasive.
4. I felt connected to the post that I saw.
5. I agree with the content of the post I saw.
6. The post I saw conveyed a positive tone.

Appendix H

25-item Attitudes Towards Homosexuality Scale developed by Falomir-Pichastor & Mugny
(2009).

Please indicate how much you agree with the following statements. There are no right or wrong answers, so please answer as openly and thoughtfully as you can.

Please use the following scale in response to the items below.

1 (Strongly Disagree) - 7 (Strongly Agree)

1. Homosexuality goes against family values. **
2. Gay couples should have the right of inheritance upon the death of their partner.
3. I feel sympathy for homosexuals.
4. I prefer to avoid bars/nightclubs frequented by gay people. **
5. Homosexuality is a natural expression of affection and sexuality.
6. Gay couples should have the same tax benefits (for example, joint income taxation) as heterosexual couples.
7. Homosexuals disgust me. **
8. I could have very close gay or lesbian friends.
9. Homosexuality is incompatible with starting a family. **
10. Gay people should have the same career opportunities as heterosexuals.
11. I feel empathy towards homosexuals.
12. I would be embarrassed if a gay person made sexual advances to me. **
13. Gay couples (with or without adopted children) represent an enrichment for the traditional family model.

14. Gay couples should have the right to a residence permit if the partner is a foreigner.
15. I am embarrassed by homosexuals. **
16. I would be happy if my children had a gay or lesbian teacher.
17. Heterosexual couples can learn something from gay couples.
18. Gay couples should have the right to marry.
19. I pity gay people. **
20. I would not mind having a gay or lesbian work colleague.
21. Homosexuality is contrary to human nature. **
22. Gay couples should have the right to adopt children.
23. I would support homosexuals if asked.
24. It would bother me to share an apartment with a gay person. **
25. It would not bother me at all if my child was gay or lesbian.

Note: Items 1, 4, 7, 9, 12, 15, 19, 21, 24 (denoted with **) are reverse scored.