CONTEXT AND THE AUTHENTIC SELF: THE IMPACT OF PERCEIVED STEM OBJECTIVITY NORMS ON SELF-CONCEPT BELIEFS AND WELL-BEING

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Tessa M. Benson-Greenwald

CONTEXT AND THE AUTHENTIC SELF: THE IMPACT OF PERCEIVED STEM OBJECTIVITY NORMS ON SELF-CONCEPT BELIEFS AND WELL-BEING

Across three studies, I investigated 1) beliefs about the culture of objectivity in STEM and 2) the impact of STEM objectivity norms on people's anticipated experiences in those contexts. In Study 1, people consensually perceived STEM professionals as more objective than subjective and having greater capacity for mental agency (e.g., planning and self-control) than human experience (e.g., emotions and sensations). Yet, neither subjectivity nor human experience were viewed as incompatible for STEM professionals. Thus, Study 1 demonstrated that although normative beliefs about people in STEM careers reflect a stereotypic image of STEM professionals as objective and mentally agentic, this image does not exclude subjectivity or human experience. In sum, these results suggest participants view objectivity and subjectivity as co-occurring rather than oppositional. These objectivity norms in the culture of science can influence people's anticipated experiences of authenticity and belonging in STEM contexts: People anticipated more authenticity and belonging when they considered entering a physics department that explicitly valued integrating objectivity and subjectivity, rather than exclusively objectivity (Studies 2 and 3). This greater authenticity was due, in part, to beliefs that the integrated objectivity context would allow for a range of thought processes, both rational and experiential (Studies 2 and 3). Further, this norms-to-authenticity effect had consequences for anticipated belonging and well-being (Study 3). People expected to feel greater belonging and well-being in integrated objectivity (vs. exclusive objectivity) STEM contexts partly because of this increased sense of authenticity.

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Context and the Authentic Self: The Impact of Perceived STEM Objectivity Norms on Self-Concept Beliefs and Well-Being

The past 15 years have seen frequent calls from universities, professional organizations, and government agencies to focus on the recruitment and retention of talented individuals into science, technology, engineering, and math (STEM) career pathways. Though these efforts are designed to increase participation in STEM broadly, they are often specifically aimed at fostering participation among people belonging to groups that have historically been excluded from the enterprise of science (e.g., people of color, white women). This shift in who participates in STEM means that the perspectives and experiences of scientists also requires a broadening to include a range of unique viewpoints. Yet, expectations for how to behave and what to value (i.e., norms; Cialdini & Trost, 1998) are communicated, both directly, and indirectly, through interactions and observation of others in these STEM environments. These expectations are powerful and can shape people's expectations of how they might think, behave, and engage with the context around them. Such contextual norms may also signal whether a context allows people to be themselves and to belong. Thus, norms may play an important role in fostering how people understand their place and fit within an environment.

Put simply, these questions are rooted in theories that position the self as a product of culture and institutional contexts. The self is a powerful and complex cognitive framework that helps organize the way people view and interact with the world around them (McConnell et al., 2013). Through observing and interacting with the cultural context over time, people internalize those messages as beliefs about who they are (Markus & Kitayama, 2010). Yet, cues in an environment can also foster selves, cognitions, and behaviors that are most relevant to that context (Markus & Wurf, 1987). Thus, contexts can shape the self and psychology.

Understanding the consequences for people's self beliefs as a product of the context is at the core of the State Authenticity as Fit to Environment model (i.e., SAFE model; Schmader & Sedikides,

2018). The SAFE model posits that state authenticity, or the sense that people are in accordance with their genuine selves, is an outcome of perceptions of the environment. The perceived alignment with the environment, or fit, stems from signals that 1) an activated self-concept will be aligned with the genuine self (self-concept fit), 2) the institutional structure has similar values (goal fit), and 3) real or implied others would accept and validate a person's sense of self (social fit). When these three forms of fit are present, people experience that environment as authentic. Still, some contexts can foster a broader sense of fit – allowing for a range of different people to feel that they are welcome in STEM contexts. For example, organizational and educational contexts that view intelligence and ability as developed through effort (i.e., growth-oriented) rather than innate (i.e., fixed-oriented) promote trust for a variety of individuals (Emerson & Murphy, 2015), enhance beliefs about the availability of a range of goal pursuit opportunities (Fuesting et al., 2019), and decrease expected and experienced psychological vulnerability across student social identities (Muenks et al., 2020). In the present work, I asked what signals in the environment can cue signal a broad sense of fit, allowing for a range of people to feel authentic.

Here, I investigated the contextual roots of authenticity, belonging, and well-being by examining the impact of norms on these psychological experiences. Specifically, I examined whether messages that explicitly communicate valuing the integration of facts and logic (i.e., objectivity; Uhlmann & Cohen, 2007) with perspectives and experiences (i.e., subjectivity; Weick & Guinote, 2008) in science contexts can foster a range of thought processes that are experienced as authentic and, in turn, benefit belonging and well-being.

The Self in Context: Norms, Thought Processes, and Capacities

What do norms communicate about a context?

Norms are one way through which the constraints and opportunities of a particular culture are communicated. Social norms are the implicit or explicit rules that are used to guide behavior within a

particular group or society (Cialdini & Trost, 1998). In the larger context of culture, they convey information to individuals both about how to engage with their roles (such as gender or occupation) and how others engage with them. Descriptive norms signal which behaviors may be appropriate or effective in a given circumstance, whereas injunctive norms indicate which behaviors may or may not be considered socially acceptable (Prentice & Carranza, 2002). Although there are different types of norms, they are often aligned. For example, both descriptive and injunctive norms encourage women to be warm, kind, and other-oriented (Prentice & Carranza, 2002).

An important way through which people come to perceive cultural norms is via repeated observations of the people and behaviors of those in the culture or role (Koenig & Eagly, 2014). For example, the historical overrepresentation of men in science has fostered perceptions that behaviors and opportunities in the scientist role overlap more with men's gender role than with women's gender role (Carli et al., 2016). Similarly, some domains of science (e.g., computer science) are documented as having cultures characterized by valuing, rewarding, and viewing as standard behaviors associated with the male gender role (i.e., masculine defaults; Cheryan & Markus, 2020) Yet, other behaviors and values are repeatedly emphasized in science and among scientists. Although humans rely on thought processes, objectivity, or reliance on facts and logic (Uhlmann & Cohen, 2007), and subjectivity, or reliance on emotions and experiences (Weick & Guinote, 2008), a hallmark of the scientific process is objectivity to serve the goals of transparency and replicability. This emphasis on objectivity as an ideal in the scientific process (McNamee, 2005; Ray, 1979), may foster perceptions that both the process and *culture* of science normatively value objectivity more than subjectivity.

Norms Influence Perceptions

Learning about social norms alters the ways in which people perceive objects and does not just shift their judgments about those objects. Norms can powerfully influence an individual's perceptions (Cialdini & Trost, 1998; Sherif & Sherif, 1953). Indeed, foundational social psychological research found

that participants who were asked to estimate the movement of a light spot, though it was stationary, chose estimates similar to that of the overall group both in the presence of that group and when they were alone (Sherif, 1935). Thus, the effect of norms on perceptions persisted even when participants were no longer in the presence of the group. Recently, differences in the processing of perceptual information (i.e., perceptual bias) rather than shifts in the decision criteria (i.e., judgmental bias) have been identified as a mechanism of the norms-to-perceptions effect (Germar & Mojzisch, 2019). My dissertation explored the impact of norms on beliefs about the self: How do norms influence expectations about thought processes and authenticity?

How can norms shape beliefs about the self? In addition to affecting how individuals view the world around them, norms can also foster differential perceptions of the self. Women who were highly identified with the domain of math reported identifying less with feminine characteristics that are incongruent with math and science norms (e.g., emotionality and wanting children), than women who were not highly identified (Pronin et al., 2004). Importantly, it does not appear that this bifurcation was merely an artifact of self-selection into STEM domains as these identity differences emerged only when confronted with data that highlighted the threatening incompatibility between women and STEM. Yet, when domain-specific norms allow for the *integration* of stereotypic and counterstereotypic elements, this integration can foster a variety of beliefs about the possibilities in the context – what goals can the self pursue in this environment? Students who perceived STEM faculty as endorsing beliefs that STEM ability can be grown or developed (vs. an innate ability) saw more opportunities for other-oriented *and* self-oriented goals in STEM contexts (Fuesting et al., 2019). Taken together, this literature thus indicates that domain-specific cultural norms can influence how people in those domains *perceive* themselves and the opportunities available to them.

Here, I theorize that norms can also signal opportunities for people to *be* themselves. Put simply, norms may communicate whether a context affords people the ability to be authentic or not. I

hypothesize that people who consider entering STEM contexts whose norms explicitly value the integration of objectivity and subjectivity into STEM contexts (vs. exclusively objectivity) will expect to feel more authentic in those contexts. In other words, STEM contextual norms surrounding objectivity and subjectivity may yield inferences about whether this context values and affords the opportunity for people to be themselves.

How can norms shape thought processes? The hypothesized authenticity fostered by integrating subjectivity into STEM contextual norms may be due, in part, to a sense that these norms foster beliefs that a range of thought processes are possible and valued in this context. Rational thinking is characterized by analytic and logical decision-making whereas experiential thinking is characterized by intuitive and emotional decision-making (Pacini & Epstein, 1999). Other traditions in psychology have treated capacities for rational, higher-level thinking and emotional, sensational thinking as fundamental dimensions of humanness (i.e., mental agency and human experience respectively; H. M. Gray et al., 2007; K. Gray et al., 2011). Regardless of the specific terminology, rationality and experientiality appear to map neatly on to early philosophical and scientific conceptualizations of the mind and body as distinct and separable entities (i.e., dualism). From this perspective, with its focus on thinking and planning, rational thought processes align with the "mind"; in contrast, with its focus on gut intuition and emotions, experiential thinking corresponds with the "body" (K. Gray et al., 2011). Yet, more modern conceptualizations of the mind and body do acknowledge their interrelatedness: The World Health Organization moved to define health as incorporating physical, mental, and social well-being (Mehta, 2011; World Health Organization, 1948). Taken together, STEM cultural norms may shape beliefs about the range of thought processes that are afforded in these environments. Thus, norms that foster both rational and experiential thought processes might also yield greater authenticity because the integration of these thought processes are core components of healthy humanity. As such, I hypothesized that when people considered entering STEM contexts that integrated objectivity and subjectivity (vs.

exclusive objectivity), they would anticipate feeling greater authenticity because these environments explicitly allow for the harmonization of rational and experiential thought processes.

How Does State Authenticity Relate to Belonging and Well-Being?

The potential for norms to influence people's anticipated thought processes and experiences of authenticity suggests that there may be also implications belonging and well-being. Belonging, or social connection with others, is a fundamental need (Baumeister & Leary, 1995). When social needs are not being met, people respond in ways similar to when their physiological needs are not being met (Gardner et al., 2000). Physiologically, experiences of thwarted belonging (or social pain) activate the same brain regions (i.e., dorsal anterior cingulate cortex) as physical pain (Williams & Nida, 2011). For these reasons, a large body of research has linked belonging to well-being (for a review see Baumeister & Leary, 1995; Pickett & Gardner, 2005), such that lower levels of belonging are associated with lower well-being (e.g., less positive affect, more negative affect, loneliness etc.).

Though widely studied as global experiences, belonging and well-being can be and often are context-based. Belonging can serve as a general inference about the quality of or possibility for fit between the self and a particular environment, based on cues, events, and experiences (Walton & Brady, 2017). From a social structural perspective, belonging stems from one's perceived alignment with particular social roles (Belanger et al., 2020): Perceiving opportunities to work with and help others in a science lab is associated with higher levels of belonging in the role. An important aspect of context-specific belonging is being able to authentically express the self, without concern for others' expectations or social constraint (Schmader & Sedikides, 2018). If a context is perceived to stifle one's unique experiences and perspectives, it may be experienced as inauthentic and, in turn, it may have negative consequences for belonging and well-being. Thus, perceived contextual norms may be one signal of whether someone can be themselves and valued by others in that environment.

Because norms communicate the values and behaviors that are expected and acceptable in a particular environment or group (Cialdini & Trost, 1998), they can also signal to others who does and does not belong. According to the SAFE model, whether contextual norms have an impact on belonging and well-being relies on whether the behavioral and cognitive product of those norms is experienced as authentic or inauthentic (Schmader & Sedikides, 2018). Moreover, having to live up to the cultural prescriptions that are dictated by social norms can be experienced as constraining and a source of discomfort and stress (Prentice & Carranza, 2004). Situations or environments that lead people to conform to goals that they do not value can erode state-authenticity and signal a lack of belonging (Erickson, 1994, 1995; Schmader & Sedikides, 2018).[1] In contrast, when norms foster perceptions that one can be their true self, pursue their valued goals, and receive validation from others, people will experience state authenticity and, in turn, belonging and well-being. Drawing on core predictions from the SAFE model (Schmader & Sedikides, 2018), I predict that when norms foster the ability to engage in a range of important human thought processes, these will be experienced as authentic and enhance belonging and well-being.

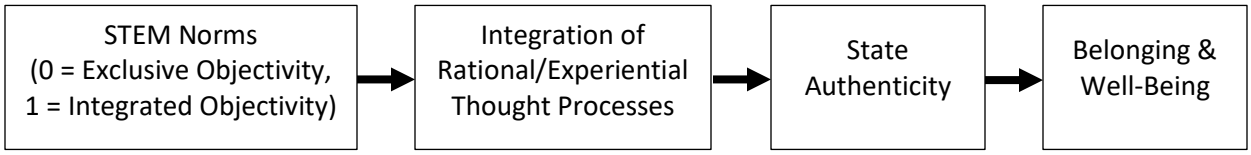
Current Research

Figure 1 provides an overview of my conceptual model. Drawing on the SAFE model (Schmader & Sedikides, 2018), I hypothesized that when norms foster the ability to engage in a range of important human thought processes this will have positive consequences for belonging and well-being. Specifically, the ways in which the context shapes authenticity will, in turn, predict belonging and well-being. I investigated this theoretical process in the context of STEM. I anticipate that STEM is perceived as

[1] It is certainly possible that conformity to goals that are not valued could lead instead to attitude change through the process of cognitive dissonance. Dissonance typically requires foreseeability of the consequence of the action (Cooper & Fazio, 1984). Thus, unless people are clearly made aware of the consequences of conforming to goals that they do not value it seems less likely that they would experience the arousal necessary to catalyze dissonance processes.

normatively valuing objectivity more than subjectivity. However, I expect that STEM norms that integrate objectivity and subjectivity (vs. exclusively valuing objectivity) will lead people to anticipate that they can engage in thought processes that integrate rationality and experientiality, aligning with the stated STEM cultural norm. Finally, I hypothesize that the consequences of expecting to engage in a range of thought processes will be associated with anticipated authenticity and, in turn, belonging and well-being.

Figure 1. Theoretical Model



Note. In the context of the present studies, integration of rational and experiential thought processes means that both are present, rather than necessarily intertwined.

Across three studies, my dissertation investigated the impact of STEM objectivity norms on thought processes, belonging, and well-being. Study 1 documents beliefs regarding the extent to which STEM professionals are believed to be capable of objectivity, subjectivity, mental agency, and human experience. Here, I investigated whether objectivity and mental agency are perceived to be more normative for STEM professionals than subjectivity and human experience. Studies 2 and 3 examined whether and how different STEM norms (exclusive vs. integrated objectivity) influence anticipated experiences of authenticity in those contexts. Study 2 tested whether STEM objectivity norms that integrate objectivity and subjectivity (vs. exclusively objectivity) foster state authenticity due, in part, to expected engagement in both rational and experiential thought processes. Study 3 replicated the impact of integrated objectivity contexts on state authenticity while also investigating the consequences of these self-in-context processes for belonging and well-being. Thus, Study 3 asked whether integrated

objectivity contexts (vs. exclusive objectivity) fostered greater state authenticity which, in turn, increased belonging and well-being in those contexts.

Study 1

Study 1 sought to demonstrate that people in STEM careers are commonly perceived as more objective than subjective and as having greater capacity for mental agency than for human experience. Further, this study allowed for an initial exploration of the relationships among objectivity, subjectivity, mental agency, and human experience. I hypothesized that beliefs about STEM role occupants' objectivity and subjectivity would predict ascriptions of their capacities for mental agency and human experience. These inferences about role occupants can provide information about the perceived normative properties of the role (Koenig & Eagly, 2014). Because people's perceptions may differ as a function of their experience with STEM environments, I also investigated whether perceptions are consensual across STEM and non-STEM majors.

Method

Participants. The sample for analyses consisted of 163 undergraduate students (M = 18.94, SD = 1.06) from a large Midwestern university who participated in exchange for partial fulfillment of a course requirement. An additional 10 respondents were not included in analyses because they failed attention checks. Ninety-eight participants identified as women, 61 as men, 1 as transgender male, 1 as non-binary, and 2 did not report. The sample included 111 participants identifying as White, 16 as Black, 15 as Asian/Asian American, 11 as Hispanic or Latinx, and 10 as multi-racial. One hundred eight participants were majoring in business, social sciences, education, or fine arts and 55 were majoring in STEM according to the definition of STEM used in federal initiatives (Chen & Weko, 2009). STEM fields included natural science, engineering, computing/technology fields, and mathematics.

Sensitivity analyses showed sufficient power (0.80, alpha = .05) to detect small-to-medium sized effects (Faul et al., 2007, 2009). Mixed-model ANOVAs with 2 groups (STEM, non-STEM) and 2 dependent measures could detect within between interactions with an effect size of η^2_p =.012 or larger. Regression models with two predictors were powered to detect regression coefficients of f^2 = .06 or larger.

Procedure. Participants were asked to rate a total of 13 career occupants on their mental agency, human experience, objectivity, and subjectivity. Of these, 4 were the core target STEM careers and 9 distractor careers in other fields (see Table 1 for full list of careers). Careers were drawn from Diekman et al., 2010. Finally, participants answered demographic questions, were debriefed, and received credit for their participation.

Table 1. Study 1 Careers

Target STEM Careers
Mechanical engineers
Computer scientists
Aerospace engineers
Environmental scientists
Distractor Careers
Lawyers
Architects
Dentists
Physicians
Pre-school or kindergarten teachers
Human resources managers
Social workers
Registered nurses
Education administrators

Measures. For each career, items for mental agency, human experience, objectivity, and subjectivity were intermixed. All items were presented with the question stem "How capable are [career people] of…". When rating mechanical engineers, for example, participants saw the stem "How capable are mechanical engineers of…". Ratings were made on a scale from 1 (*Not at all*) to 7 (*Extremely*) for all measures.

Objectivity. The measure of objectivity included one item for each career: *objectivity.* Items were averaged across STEM careers to create an index of objectivity (α = 0.85).

Subjectivity. The measure of subjectivity simply one item for each career: *subjectivity.* Items were averaged across STEM careers to create an index of subjectivity (α = 0.85).

Mental agency. Mental agency items included 5 items for each career: *self-control, planning, memory, communication,* and *thought* (drawn from H. M. Gray et al., 2007). Items were averaged across STEM careers to create an index of mental agency (α = 0.94).

Human experience. Human experience items included six items for each career: *hunger, fear, pain, pleasure, rage, joy, and pride* (drawn from H. M. Gray et al., 2007). Items were averaged across STEM careers to create an index of human experience (α = 0.97).

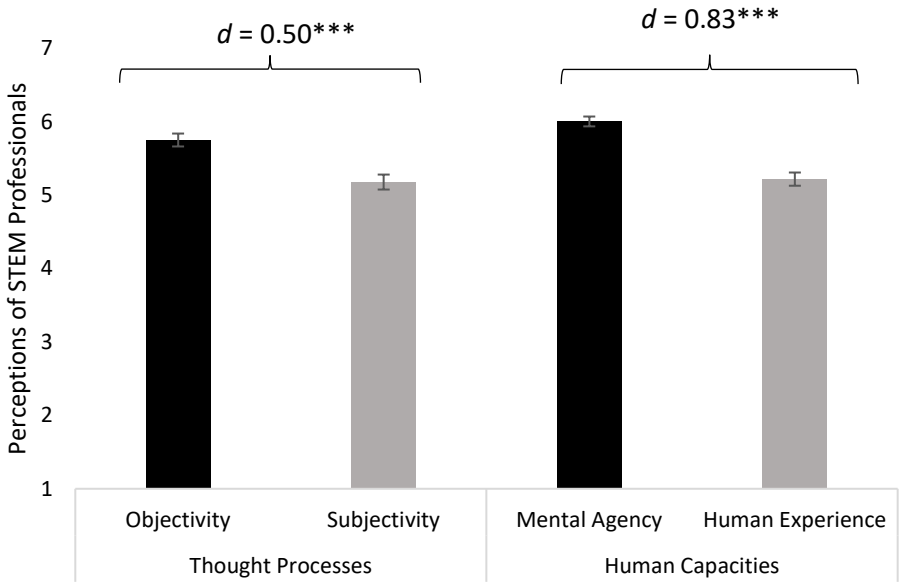
Results

Perceptions of objectivity vs. subjectivity and mental agency vs. human experience in STEM professionals. A 2 (Thought processes: Objectivity, Subjectivity) × 2 (Major: STEM major, non-STEM major) mixed-model analysis of variance (ANOVA), with thought processes as a within-subjects factor, investigated the relative perceptions of STEM professionals as objective and subjective. Only a main effect of thought processes emerged, F (1, 161) = 33.88, $p < .001$, $\eta^2_p = 0.17$. As predicted, STEM professionals were perceived as more objective than subjective, $t(162) = 6.14$, $p < .001$ (Figure 2). These perceptions were not moderated by major, F (1, 161) = .01, p = .91, $\eta^2_p = 0.00$.

Similarly, a 2 (Human Capacities: Mental Agency, Human Experience) × 2 (Major: STEM major, non-STEM major) mixed-model ANOVA, with human capacity as a within-subjects factor, examined the relative perceptions of STEM professionals' capacity for mental agency and human experience. Again, only a main effect of human capacities emerged, F (1, 161) = 128.80, $p < .001$, $\eta^2_p = 0.44$. STEM professionals were rated as having greater capacity for mental agency than human experience, $t(162) = 12.17$, $p < .001$ (Figure 2). This effect was also not moderated by major, F (1,161) = 0.17, $p = .68$, $\eta^2_p =$

0.01. Thus, STEM professionals were consensually perceived as more objective (vs. subjective) and having greater mental agency (vs. experience) by both STEM majors and non-STEM majors alike.

Figure 2. Study 1: Perceptions of STEM Professionals' Thought Processes and Human Capacities



Note. Error bars represent +/- 1 SE. *** $p < .001$

Thought processes are positively related to mental agency. Mental agency was regressed on objectivity and subjectivity to test the predictive utility of each. Mental agency was positively predicted by both objectivity ($b = 0.43$, $SE = 0.05$, $\beta = 0.56$, $p < .001$) and subjectivity ($b = 0.18$, $SE = .04$, $\beta = 0.28$, $p < .001$). However, objectivity was more strongly related to mental agency than subjectivity, $Z = 2.16$, $p = .03$.

Thought processes are positively related human experience. Human experience was regressed on objectivity and subjectivity to test the predictive utility of each. As with agency, experience was positively predicted by both objectivity ($b = 0.39$, $SE = 0.06$, $\beta = 0.38$, $p < .001$) and subjectivity ($b = 0.43$, $SE = .05$, $\beta = 0.49$, $p < .001$). Though descriptively stronger, the strength of the subjectivity-to-experience relationship was not significantly different from that of the subjectivity-to-agency relationship, $Z = -0.89$, $p = .37$.

Discussion

This initial study established that people, both STEM and non-STEM majors alike, consensually perceive STEM professionals as more objective than subjective and having greater capacity for mental agency than human experience. Yet, neither subjectivity nor human experience were viewed as incompatible for STEM professionals. Indeed, overall STEM professionals were viewed capable of high levels of each thought process and human dimensions and both types of thought processes were associated with both dimensions of humanity. Thus, Study 1 demonstrates that although normative beliefs about people in STEM careers reflect a stereotypic image of STEM professionals as objective and mentally agentic, this image does not exclude subjectivity or human experience. In sum, these results suggest participants view objectivity and subjectivity as co-occurring rather than oppositional.

Study 2

Study 1 documented a nuanced image of *perceptions* of STEM professionals wherein objectivity and subjectivity are not mutually exclusive, but rather coincide with each other. These baseline beliefs are important because they can serve as a lens through which people imagine what it might be like to *enter* these STEM contexts. That is, these normative perceptions can influence people's beliefs about what it is like to exist in these environments. Study 2 shifts to explore these questions by investigating whether and how different STEM norms influence people's anticipated thought processes, human capacities, and state authenticity. Specifically, I anticipated that considering STEM contexts that valued integrating objectivity and subjectivity (vs. exclusively objectivity) would increase expectations of self-perceived authenticity in those contexts. I expected that this norms-to-state authenticity effect would be mediated, in part, by the rational and experiential thought processes people expected to participate in within these STEM contexts. In addition, I hypothesized that STEM objectivity norms would influence people's beliefs about their human capacities for mental agency and human experience.

Method

Participants. The sample for analyses consisted of 237 undergraduate students (Age: *M* = 18.94, *SD* = 1.06) from a large Midwestern university who participated in exchange for partial fulfillment of a course requirement. An additional 35 respondents were not included in analyses because they failed attention checks. One hundred seventy-four participants identified as women, 55 as men, 4 as non-binary and 4 did not report. The sample included 179 participants identifying as White, 8 as Black, 29 as Asian, 11 as Hispanic/Latinx, 13 as multi-racial, and 2 did not report. One hundred fifty-nine participants were majoring in business, social sciences, education, or fine arts and 78 were majoring in STEM according to the definition of STEM used in federal initiatives (Chen & Weko, 2009).[2] STEM fields included natural science, engineering, computing/technology fields, and mathematics.

Sensitivity analyses showed sufficient power (0.80, alpha = .05, n = 237) to detect small-to-medium sized effects (Faul et al., 2007, 2009). Mixed-model ANOVAs with 2 groups and 2 dependent measures could detect within-between interactions with an effect size of η^2_p =.09 or larger. Regression models could detect regression coefficients of 0.03 or larger in models with one to three predictors.

Procedure. First, participants completed measures assessing trait levels of experientiality and rationality. Next, participants were randomly assigned to read one of two statements regarding a physics department's approach and commitment to preparing their students, ostensibly written consensually by physics faculty at a university (procedure adapted from Fuesting et al., 2019). Prior to reading this passage participants were directed to read the description and imagine what it would be like to be in the department presented. After reading the passage, participants wrote about what it would be like to take a course in this department to enhance psychological immersion. Participants completed measures of thought processes, human capacities, and state authenticity. Finally, following

[2] Major and/or identification with STEM did not consistently moderate findings.

the completion of all demographic information and some open-ended questions about the study, participants also completed a measure of STEM identification.

Experimental manipulation. Prior to reading the departmental statement, all participants were presented with the following instructions:

> "Recently the physics faculty at University of the Sciences posted the following statement on their website regarding the department's approach and commitment to preparing their students. We are interested in the range of prospective student reactions to different science departments within universities, so even though you may not have considered taking a physics class, please read this description and imagine what it would be like in that department."

The ostensible department statements were nearly identical but differed in whether the faculty valued exclusively objectivity or valued integrating objectivity and subjectivity. In both statements the physics faculty identify training students to rely on facts and logic as part of their daily tasks as an important goal of an education in physics. Table 2 gives the statements for the exclusive objectivity and integrated objectivity conditions side-by-side. In the exclusive objectivity condition, this reliance on facts and logic is labeled as the most important goal of training – setting up the norm that objectivity is exclusively valued in this context. In the integrated objectivity condition, the statement says that the integration of experiences and perspectives is equally as important of a goal as the reliance on facts and logic – allowing for both objectivity and subjectivity to be valued in this context.

Table 2. Experimental Manipulation: Department Statements

Exclusive Objectivity	Integrated Objectivity and Subjectivity
As a preeminent institution on the cutting edge of physics, we view training our students to ***exclusively*** rely on facts and logic ***as the most important goal*** of an education in the techniques, research, and production of physics. We, the physics faculty at the University of the Sciences, believe that this training is the only way to ensure that scientists can build on previous knowledge.	As a preeminent institution on the cutting edge of physics, we view training our students to rely on facts and logic ***as an important goal*** of an education in the techniques, research, and production of physics. ***Equally as important, however, is integrating the various experiences and perspectives that each scientist brings to their pursuit of knowledge.*** We, the physics faculty at the University of the Sciences, believe that this training is the only way to ensure that scientists can build on previous knowledge.

Note. Differences have been bolded/italicized here for ease of comparison. Text was not bolded/italicized when presented to participants.

After reading one of these passages, participants completed a psychological immersion writing task and responded to the following writing prompt for 4 minutes:

> Imagine that you are considering taking a physics course in this department, perhaps to satisfy a general education requirement. What would it be like to be in this course taught by a faculty member who endorses these views? What would your experiences in this course be like? Please spend a few minutes writing your thoughts. Again, we are interested in the range of prospective student reactions, so even though you may not have considered taking a physics class, while you are writing, be sure to really imagine what it would be like in this role.

Pre-Manipulation Measures.

Trait rationality and experientiality. Participants completed items from the rational ability and experiential ability subscales of the Rational-Experiential Inventory (REI; Pacini & Epstein, 1999) to assess their trait levels of rationality and experientiality. They rated their agreement with 7 rational ability items and 7 experiential ability items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

Items were intermixed and averaged to create separate indices of trait rationality and experientiality. Reliabilities for each scale and all items are provided in Table 3.

Table 3. Trait Rationality and Experientiality

Trait Rationality (α = 0.75)	Trait Experientiality (α = 0.74)
I am not very good at solving problems that require careful logical analysis.*	I don't have a very good sense of intuition.*
I am not a very analytical thinker.*	I believe in trusting my hunches.
I am much better at figuring things out logically than most people.	If I were to rely on my gut feelings, I would often make mistakes.*
Using logic usually works well for me in figuring out problems in my life.	I hardly ever go wrong when I listen to my deepest gust feelings to find an answer.
I usually have clear, explainable reasons for my decisions.	My snap judgments are probably not as good as most people's.*
I have a logical mind.	I suspect my hunches are inaccurate as often as they are accurate.*
Reasoning things out carefully is not one of my strong points.*	I can usually feel when a person is right or wrong even if I can't explain how I know.

Note. * indicates item was reverse scored. Items are from rational ability and experiential ability subscales of Rational-Experiential Inventory (Pacini & Epstein, 1999).

Post-Manipulation Measures.

Manipulation check. Participants rated the extent to which this department values objectivity and subjectivity using 2 items: *People in this department value objectivity, or a reliance on facts and logic* and *People in this department value subjectivity, or a reliance on perspectives and experiences .* Participants rated their agreement with these statements on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

State Authenticity. Participants completed a 2-item measure of state authenticity adapted from Shelton, Richeson, and Salvatore (2005). The question stem for this measure was "As a student enrolled in a physics course in this department…" and the 2 items are *I would feel I had to change myself to fit in,* and *I would feel like my interactions with people in this department are artificial.* Participants rated their agreement with each item on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Both items were

reverse scored and averaged to create an index of state authenticity (α = 0.71) so that higher numbers indicate greater anticipated state authenticity.

Context-based rationality and experientiality. Participants rated their hypothetical engagement in rational and experiential thought processes as a student enrolled in a physics course in the department they just read about. Items were adapted from the rational engagement (10 items) and experiential engagement (10 items) subscales of the Rational-Experiential Inventory (REI; Pacini & Epstein, 1999) and ratings were made on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The question stem was "As a student enrolled in a physics course in this department…". Reliabilities for each scale and all items are provided in Table 4. Items were intermixed and averaged to create separate indices for each.

Table 4. Context-based rationality and experientiality.

Context Rationality (α = 0.76)	**Context Experientiality (0.85)**
I would try to avoid situations that require in-depth thinking about something.*	I would like to rely on my intuitive impressions.
I would enjoy intellectual challenges.	I would feel that intuition can be a very useful way to solve problems.
I wouldn't like to have to do a lot of thinking.*	I would often go by my instincts when deciding on a course of action.
I would enjoy solving problems that require hard thinking.	I wouldn't like situations in which I have to rely on intuition.*
I would feel that thinking is not my idea of an enjoyable activity.*	I would think there are times when one should rely on one's intuition.
I would prefer complex problems to simple problems.	I would think it's foolish to make important decisions based on feelings.*
I would feel that thinking hard for a long time about something gives me little satisfaction.*	I wouldn't think it is a good idea to rely on one's intuition for important decisions.*
I would enjoy thinking in abstract terms.	I generally wouldn't depend on my feelings to help me make decisions.*
I would feel that knowing the answer without having to understand the reasoning behind it is good enough for me.*	I would not want to depend on anyone who described themselves as intuitive.*
Learning new ways to think would be very appealing to me.	I would tend to use my heart as a guide for my actions.

Note. * indicates item was reverse scored. Items adapted from rational engagement and experiential engagement subscales of Rational-Experiential Inventory (Pacini & Epstein, 1999).

Human mental capacities. Participants also rated their basic human mental capacities by responding to the question stem "As a student enrolled in a physics course in this department…" and responded to the items provided in Table 5 (drawn from H. M. Gray et al., 2007). Five items assessed mental agency ($\alpha = 0.80$) and 6 items assessed human experience ($\alpha = 0.86$) and ratings were made on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Items were intermixed and averaged to create indices of mental agency and human experience.

Table 5. Human mental capacities

Mental Agency	**Human Experience**
I would be capable of self-control.	I would be capable of hunger.
I would be capable of planning.	I would be capable of fear.
I would be capable of memory.	I would be capable of pain.
I would be capable of communication.	I would be capable of pleasure.
I would be capable of thought.	I would be capable of rage.
	I would be capable of joy.
	I would be capable of pride.

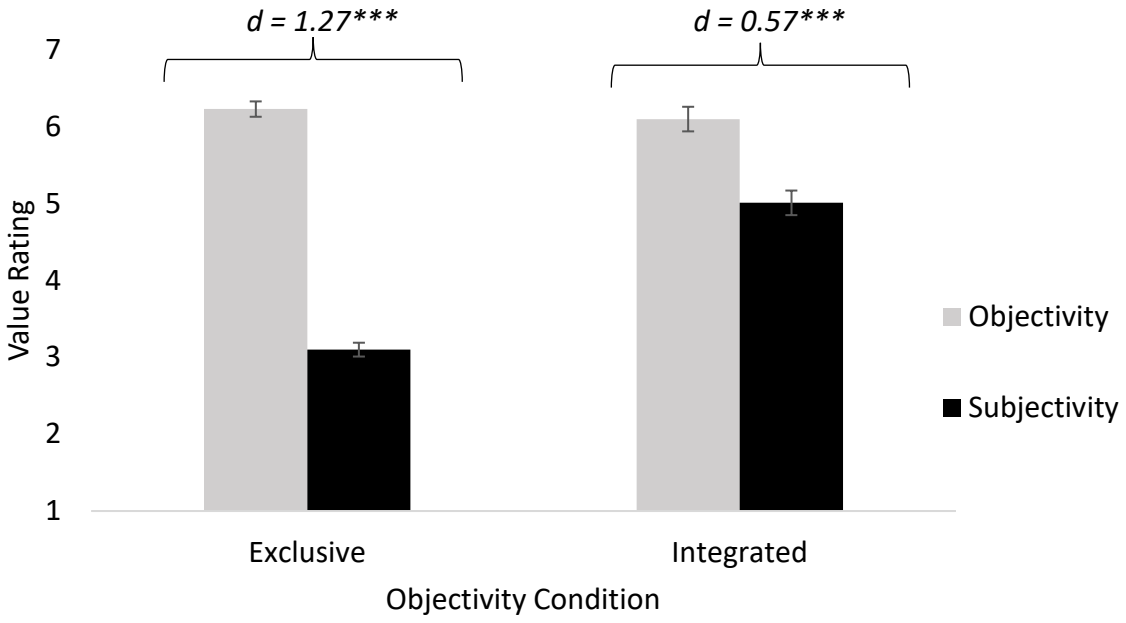
Results

Exploratory analyses using pre-manipulation measures (trait rationality and experientiality) as moderators were conducted. These variables did not consistently moderate effects and were omitted from analyses presented here (see appendix for these analyses). Initial analyses included rational and experiential ability as controls, yet effects remained significant, of similar magnitude, and in the same direction. For simplicity, therefore, these variables were omitted as controls in the analyses reported below. Initial analyses also tested for participant gender effects but did not find moderation by or main effects of gender. Thus, participant gender was omitted from analyses.

Manipulation check. First, I tested whether the manipulation of STEM objectivity norms influenced perceptions of departmental values. Data were submitted to a 2 (STEM objectivity norms: exclusive, integrated) × 2 (Department values: objectivity, subjectivity) mixed model analysis of variance

(ANOVA), with department values as a within-subjects factor. The main effects of objectivity norms [F (1, 235) = 56.57, p < .001, η^2_p = 0.19] and department values [*F* (1, 235) = 216.43, *p* < .001, η^2_p = 0.48] were subsumed by the predicted Norms × Values interaction [*F* (1, 235) = 51.83, *p* < .001, η^2_p = 0.18]. As shown in Figure 3, participants rated the exclusive condition (i.e., the department relying on facts and logic as the most important goal), as valuing objectivity more (*M* = 6.29, *SD* = 1.05) than subjectivity (*M* = 3.10, SD = 1.83), *t* (117) = 13.78, *p* < .001, *d* = 1.27. In the integrated condition, this gap was still present but was much smaller, *t* (118) = 6.17, *p* < .001, *d* = 0.57. Further, the departments were not perceived to differ in the extent to which they valued objectivity, *t* (235) = 1.40, *p* = .16, *d* = 0.18. Instead, they only differed in the extent to which they were perceived to value subjectivity: Participants believed the integrated objectivity department valued subjectivity more (*M* = 5.01, *SD* = 1.63) than the exclusive objectivity department (*M* = 3.10, *SD* = 1.83), *t* (235) = -8.48, *p* < .001, *d* = -1.10.

Figure 3. Study 2: Objectivity condition affects perceived values.

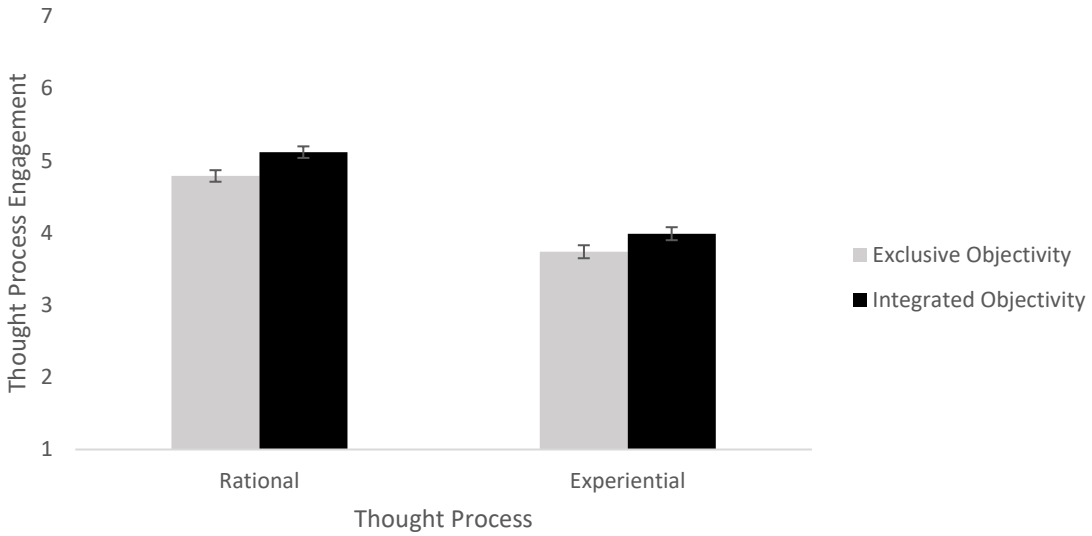


Note. Error bars represent +/-1 SE. *** *p* < .001.

How do exclusive vs. integrated objectivity contexts affect state authenticity? As predicted, participants who considered entering a STEM context that valued integrating objectivity and subjectivity anticipated greater state authenticity (M = 4.53, SD = 1.45) than those who considered entering a STEM context that exclusively valued objectivity (M = 3.88, SD = 1.40), t (235) = 3.49, $p < .001$, d = -0.45.

How do objectivity norms shape thought processes and human capacities? Data were submitted to a 2 (STEM objectivity norms: exclusive, integrated) × 2 (Thought processes: rational, experiential) mixed model ANOVA, with context-based thought processes as a within-subjects factor (see Figure 4). As predicted, a main effect of thought processes emerged, F (1, 235) = 181.23, $p < .001$, η^2_p = 0.44. Participants anticipated engaging more in rational than experiential thought processes in both STEM contexts. A main effect of objectivity norms also emerged, F (1, 235) = 8.80, p = .003, η^2_p = 0.04. Students who considered entering integrated objectivity STEM contexts expected to engage more in *both* rational and experiential thought processes than those who considered exclusive objectivity STEM contexts. The Objectivity Norms × Thought Processes interaction was not significant, F (1, 233) = 0.27, p = .60, η^2_p = 0.001.

Figure 4. Study 2: Objectivity norms affect expected thought processes



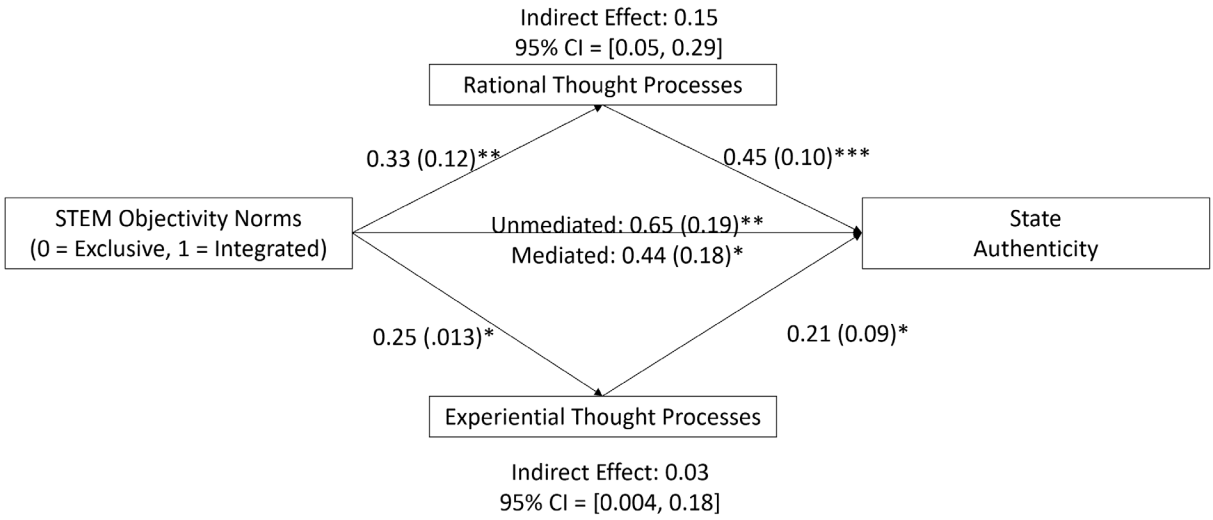
Note. Error bars represent +/- 1 SE.

Finally, I conducted a 2 (STEM objectivity norms: exclusive, integrated) × 2 (Human capacity: agency, experience) mixed model ANOVA, with mental capacity as a within-subjects factor. Surprisingly, all main effects and interactions were non-significant, *p*s > .39, $\eta^2_p < 0.003$.

Do thought processes mediate the norms-to-authenticity effect? I next tested whether anticipated engagement in rational and experiential thought processes mediated the effect of objectivity condition on state authenticity. Using PROCESS Macro Model 4 and 10,000 bootstrapped samples, I tested a mediation model with STEM objectivity norms (dummy coded; 0 = exclusive, 1 = integrated) as the independent variable, thought processes (rational, experiential) as mediators, and state authenticity as the dependent variable. As shown in Figure 5, participants who considered entering STEM contexts that valued integrated objectivity and subjectivity expected to engage more in both rational and experiential thought processes. In turn, each of these thought processes predicted greater state authenticity. The indirect effects of both rational and experiential engagement do not cross zero

and are thus significant. Further, indirect effect of rational thought processes did not significantly differ from the indirect effect of experiential thought processes (*contrast*: -0.01, 95% CI = [-0.09, 0.06]).

Figure 5. Study 2: Rational and experiential engagement mediate the Norms-to-Authenticity effect



Note. Figure presents unstandardized betas with standard errors in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

Study 2 demonstrated that different STEM norms (exclusive vs. integrated objectivity) influence people's anticipated thought processes and state authenticity. Participants who considered entering STEM contexts that valued integrating objectivity and subjectivity (vs. exclusively objectivity) anticipated feeling more like they could be themselves in those STEM contexts. This anticipation of greater state authenticity was due, in part, to expectations of being able to engage more in *both* rational and experiential thought processes. This pattern of results is consistent with the Study 1 finding that both objectivity and subjectivity were related to both higher-order thought processes (mental agency) and emotions and sensations (human experience). Study 2 thus builds on those findings by demonstrating

that when STEM norms communicate that subjectivity is also important, people feel like they can be themselves in STEM contexts.

Surprisingly, this greater sense of authenticity was not related to people's beliefs that they would have the capacity for mental agency or human experience in these contexts. These null effects of norms on human capacities were surprising given that Study 1 did show evidence of perceived differences in these capacities for STEM professionals. I will return to this point in the general discussion. Yet, contextual rationality and experientiality *did* emerge as possible mediators given the robust effects of STEM objectivity norms on contextual thought process engagement.

Finally, the manipulation check assessing whether people viewed the integrated and exclusive objectivity contexts as valuing objectivity and subjectivity to different degrees yielded an unexpected pattern. Participants who considered entering the integrated objectivity context still perceived the department as valuing objectivity more than subjectivity. Yet, the intent of the wording within the manipulation was to foster views that the department equally valued both objectivity and subjectivity. Though intriguing, this finding may be due to participants holding pre-existing beliefs about physics as being relatively more objective such that the manipulation particularly affected views of the department's valuing of subjectivity. Still, that the integrated condition produced the hypothesized effects suggests that the department does not need to perceived as *equally* valuing both objectivity and subjectivity for people to experience the psychological benefits. Rather, providing space to actively value each yields valuable outcomes for how people expect to engage with these STEM contexts.

Study 3

Having established the effect of different STEM objectivity norms on state authenticity in Study 2, I next turned to investigating the consequences of these norms for belonging and well-being. Drawing from the SAFE model (Schmader & Sedikides, 2018), the effect of these norms on belonging and well-

being may rely on whether these norms and thought processes are experienced as authentic. In Study 3 I thus predicted that those who considered entering STEM contexts that integrated objectivity and subjectivity (vs. exclusively objectivity) would feel a greater sense of belonging and well-being. Aligned with the SAFE model (Schmader & Sedikides, 2018), I expected this norms-to-belonging/well-being effect to be due, in part, to those norms being viewed as more authentic.

Method

Participants. The sample for analyses consisted of 381 undergraduate students (Age: *M* = 18.87, *SD* = 1.11) from a large Midwestern university who participated in exchange for partial fulfillment of a course requirement. An additional 52 respondents were not included in analyses because they did not complete the immersive writing task (n = 35) or failed attention checks (n = 17). Two hundred thirty-three participants identified as women, 140 as men, 4 as non-binary and 4 did not report. The sample included 269 participants identifying as White, 19 as Black, 51 as Asian, 22 as Hispanic/Latinx, 14 as multi-racial, and 7 did not report. Two hundred sixty-five participants were majoring in business, social sciences, education, or fine arts and 115 were majoring in STEM according to the definition of STEM used in federal initiatives (Chen & Weko, 2009).[3] STEM fields included natural science, engineering, computing/technology fields, and mathematics.

Sensitivity analyses showed sufficient power (0.80, alpha = .05, n = 381) to detect small-to-medium sized effects (Faul et al., 2007, 2009). Mixed-model ANOVAs with 2 groups and 2 dependent measures could detect within between interactions with an effect size of η^2_p =.07 or larger. Regression models could detect regression coefficients of 0.02 or larger in models with one to three predictors.

Procedure. The procedure for Study 3 was identical to Study 2. However, Study 3 also measured belonging, and well-being.

[3] Major and/or identification with STEM did not consistently moderate findings.

Pre-Manipulation Measures. Measures of trait rationality (α = 0.75) and experientiality (α = 0.71) were identical to those used in Study 2.

Post-Manipulation Measures. Participants completed the same manipulation check, measures of state authenticity (α = 0.74), and context-based rationality (α = 0.79), experientiality (α = 0.86), mental agency (α = 0.81), and human experience (α = 0.83) used in Study 2.

Belonging. Participants completed a 10-item version of the previously validated Sense of Belonging in Math scale (Good et al., 2012). Items were preceded by the phrase "As a student enrolled in a physics course in this department…" and rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Items were: *I would feel like I belong to the science community, I would feel accepted, I would feel comfortable, I would feel like an outsider*, I would feel like I fit in, I would feel nervous*, I would feel inadequate*,* and *I would feel valued.* Following reverse-scoring of items marked with an asterisk, items were averaged to create an index of belonging (α = 0.91).

Well-being. Participants completed an adapted version of the Flourishing Scale which was developed to assess people's psychological well-being (Diener et al., 2010). Items were preceded by the phrase, "As a student enrolled in a physics course in this department, I would feel like…". The measure included the following 8 items: *I lead a purposeful and meaningful life, my professional relationships are supportive and rewarding, I am engaged and interested in my daily activities, I actively contribute to the happiness and well-being of others, I am competent and capable in the activities that are important to me, I am a good person and live a good life, I am optimistic about my future,* and *people respect me*. Items were averaged to create an index of well-being (α = 0.91).

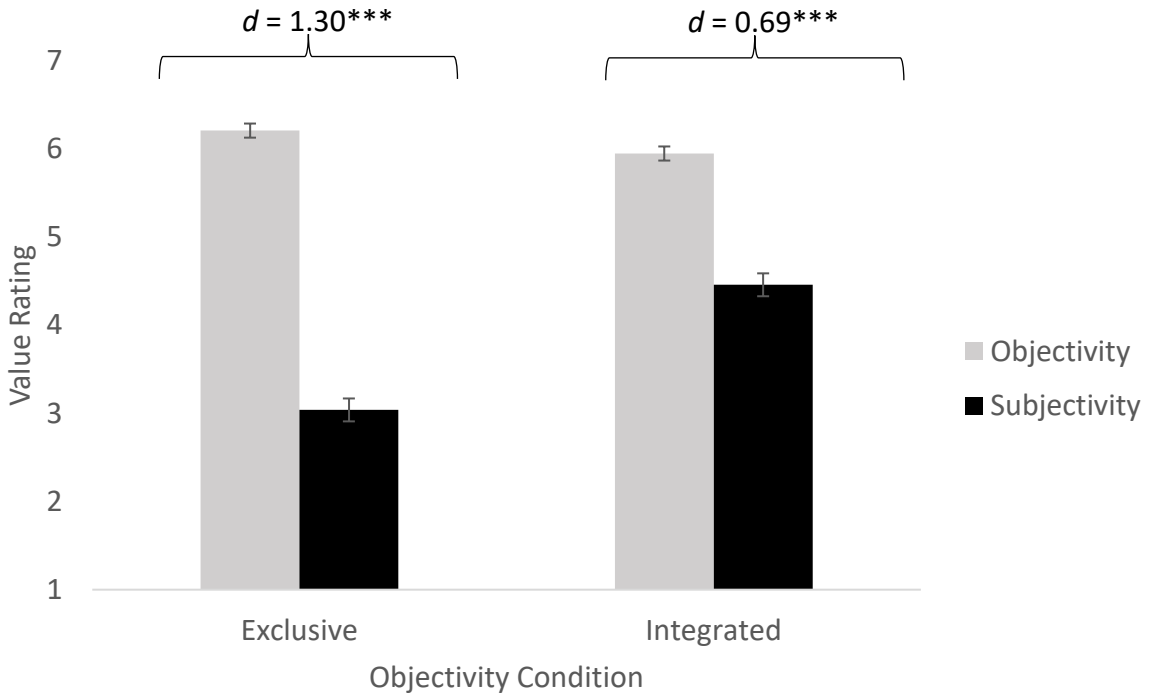
Results

Exploratory analyses using pre-manipulation measures (trait rational ability and experiential ability) as moderators were conducted. These variables did not moderate effects and were omitted from

analyses presented here. Initial analyses included rational and experiential ability as controls, yet effects remained significant, of similar magnitude, and in the same direction. For simplicity, therefore, these variables were omitted as controls in the analyses reported below. Initial analyses also tested for participant gender effects but did not find moderation by or main effects of gender. Thus, participant gender was omitted from analyses.

Manipulation check. First, I tested whether the manipulation of STEM objectivity norms influenced perceptions of departmental values. Data were submitted to a 2 (STEM objectivity norms: exclusive, integrated) × 2 (Department values: objectivity, subjectivity) mixed model ANOVA, with department values as a within-subjects factor. As in Study 2, the main effects of objectivity norms, F (1, 378) = 37.69, $p < .001$, $\eta^2_p = 0.09$, and department values, F (1, 378) = 387.97, $p < .001$, $\eta^2_p = 0.51$ were subsumed by a significant Norms × Values interaction, F (1, 378) = 50.13, $p < .001$, $\eta^2_p = 0.12$ (Figure 6). Again, participants viewed the exclusive objectivity department as valuing objectivity more (M = 6.21, SD = 1.09) than subjectivity (M = 3.04, SD = 1.79), t (190) = 17.90, $p < .001$, d = 1.30. This perceived gap in values (*objectivity*: M = 5.95, SD = 1.05; *subjectivity*: M = 4.46, SD = 1.80) was still present in the integrated objectivity department but was much smaller in size, t (188) = 9.52, $p < .001$, d = 0.69.

Figure 6. Study 3: Objectivity condition affects perceived values.

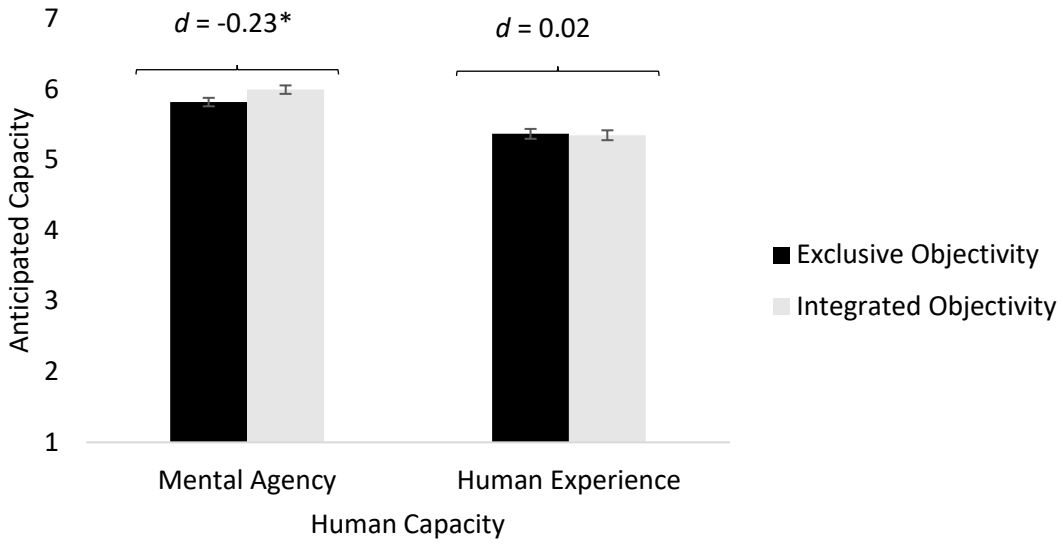


Note. Error bars represent +/-1 SE. *** $p < .001$.

How do objectivity norms shape context-based thought processes and human capacities? Data were submitted to a 2 (STEM objectivity norms: exclusive, integrated) × 2 (Thought processes: rational, experiential) mixed model ANOVA, with thought engagement as a within-subjects factor. Replicating Study 2, the predicted main effect of thought processes emerged, F (1, 378) = 178.28, $p < .001$, η^2_p = 0.31. Participants anticipated engaging more in rational (M = 4.96, SD = 0.94) than experiential (M = 3.96, SD = 1.12) thought processes in both STEM contexts. Also replicating Study 2, a main effect of objectivity norms emerged, F (1, 378) = 6.02, p = .015, η^2_p = 0.016. Students who considered entering integrated objectivity STEM contexts expected to engage more in *both* rational and experiential thought processes (M = 4.54, SD = 0.65) than those who considered exclusive objectivity STEM contexts (M = 4.37, SD = 0.77). The Objectivity Norms × Thought Processes interaction was not significant, F (1, 378) = 0.15, p = .70, $\eta^2_p < 0.001$.

Data were submitted to a 2 (STEM objectivity norms: exclusive, integrated) × 2 (Human capacity: agency, experience) mixed model ANOVA, with human capacity as a within-subjects factor. The main effect of human capacity, F (1, 378) = 155.04, $p < .001$, $\eta^2_p = 0.29$, was subsumed by the Objectivity Norms × Human Capacity Interaction, F (1, 378) = 4.86, $p = .03$, $\eta^2_p = 0.01$. As shown in Figure 7, people anticipated greater capacity for mental agency when they considered entering the integrated objectivity context (M = 5.99, SD = 0.69) than when they considered entering the exclusive objectivity context (M = 5.82, SD = 0.83), t (378) = -2.25, $p = .03$, d = -0.23. There was no difference in expected capacity for human experience, t (378) = 0.17, $p = .86$, d = 0.02.

Figure 7. Study 3: Objectivity Norms × Human Capacities.



Note. Error bars represent +/- 1 SE. * $p < .05$

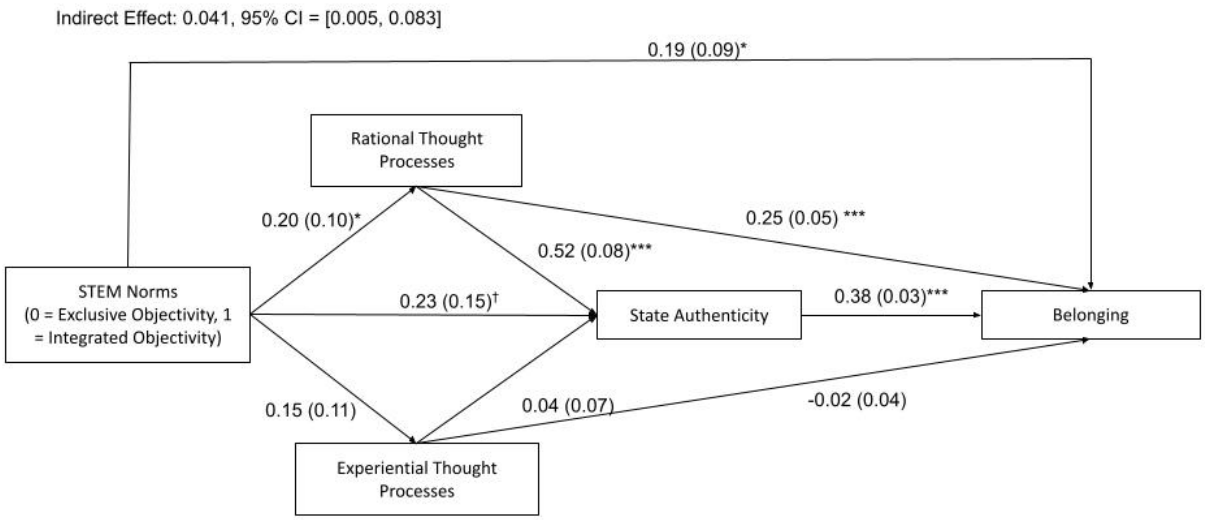
How do exclusive vs. integrated objectivity contexts affect state authenticity? Replicating Study 2, participants who considered entering STEM contexts that valued integrating facts and logic with perspectives and experiences anticipated greater state authenticity (M = 4.33, SD = 1.48) than those who considered entering STEM contexts that exclusively valued relying on facts and logic (M = 3.98, SD = 1.53), t (378) = -2.24, $p = .025$, d = -0.23.

Do STEM objectivity norms affect anticipated belonging and well-being? Participants who considered entering the integrated objectivity STEM context anticipated greater belonging (*M* = 4.50, *SD* = 0.99) than those who considered entering the exclusive objectivity STEM context (*M* = 4.13, *SD* = 1.17), *t* (377) = -3.31, *p* = .001, *d* = -0.34. Participants also expected greater well-being in the integrated objectivity department (*M* = 5.35, *SD* = 0.94) than in the exclusive objectivity department (*M* = 5.17, *SD* = 1.13), *t* (377) = -1.75, *p* = .08, *d* = -0.18.

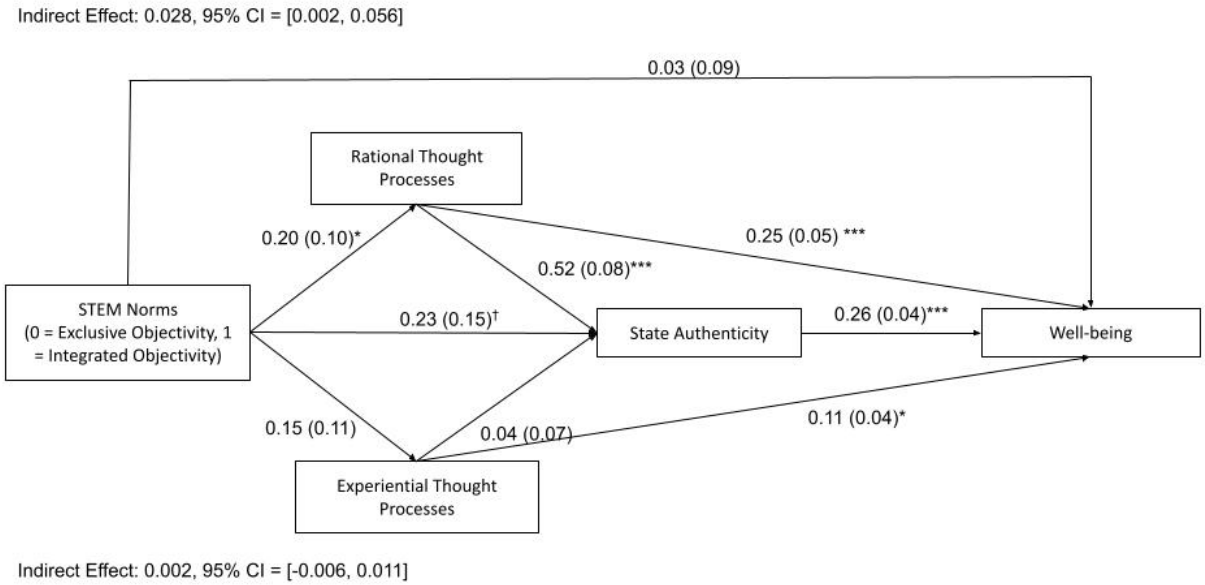
Thought processes and state authenticity mediate the effect of objectivity norms on belonging and well-being. Finally, I investigated whether STEM objectivity norms were associated with state authenticity and belonging through heightened contextual thought processes. tested a parallel-serial mediation model in which STEM norms predicted contextual rationality and contextual experientiality, which predicted state authenticity, which in turn predicted belonging (see Figure 8, Hayes PROCESS macro model 80; 10,000 bootstrapped samples). In this model, the indirect effect was significant through rational thought processes but not through experiential thought processes. However, the indirect effect of rational thought processes did not significantly differ from the indirect effect of experiential thought processes (*contrast*: 0.01, 95% CI = [-0.018, 0.048]). This pattern was replicated in the model examining well-being as the dependent variable (*contrast*: 0.01. 95% CI = -0.015, 0.037]).

Figure 8a-b. Parallel-Serial Path Model

A. Belonging



B. Well-being



Note. Figure presents unstandardized betas with standard errors in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

In a direct replication of Study 2, Study 3 provided further evidence that participants who considered entering STEM contexts that valued integrating objectivity and subjectivity (vs. exclusively objectivity) anticipated feeling more like they could be themselves in those STEM contexts. STEM objectivity norms affected expectations of belonging and well-being within physics departments. Study 3 also extends these findings by linking these norms-to-authenticity processes to belonging and well-being. Specifically, those who considered entering a STEM context that valued integrating objectivity and subjectivity anticipated greater belonging and well-being than those who considered entering a STEM context that exclusively valued objectivity. Consistent with the SAFE model (Schmader & Sedikides, 2018), these effects were due, in part, to feeling more authentic in the integrated objectivity contexts than in the exclusive objectivity contexts. Thus, this study demonstrates that when STEM contexts make space for people's perspectives and experiences, they feel greater authenticity, belonging, and well-being. Because belonging stems from one's perceived alignment with a particular social context (Belanger et al., 2020), these findings thus highlight that a context's perceived norms around ways of thinking can be one signal of that alignment.

Contrary to Study 2, Study 3 showed that only anticipated rationality was a significant mediator of the norms-to-authenticity effect. However, the nonsignificant contrast suggests that the indirect effects of rationality and experientiality are statistically equivalent. Further, contextual norms had an impact on peoples expected human capacities in these STEM contexts: People expected to have a greater capacity for mental agency in the integrated objectivity condition than the exclusive objectivity condition but showed no difference in their expectation of capacity for human experience. I will return to these intriguing results in the general discussion.

General Discussion

Across three studies, I investigated 1) beliefs about the culture of objectivity in STEM and 2) the impact of STEM objectivity norms on people's anticipated experiences in those contexts. In Study 1, STEM professionals were perceived as more objective (vs. subjective) and more mentally agentic (vs. experiential). Yet, the perception that STEM professionals were still reasonably capable of both subjectivity and experience suggests that, in participants' minds, both types of thought processes and human capacities can co-exist in STEM contexts.

These objectivity norms in the culture of science can influence people's anticipated experiences of authenticity and belonging in STEM contexts: People anticipated more authenticity and belonging when they considered entering a physics department that explicitly valued integrating objectivity and subjectivity, rather than exclusively objectivity (Studies 2 and 3). Participants also expected to be able to engage in a range of thought processes, both rational and experiential (Studies 2 and 3). However, the studies differ in whether both thought processes (Study 2) or only rational thought processes (Study 3) were associated with authenticity. Further, this norms-to-authenticity effect had consequences for anticipated belonging and well-being (Study 3). Indeed, people's expectations of belonging and well-being in integrated objectivity (vs. exclusive objectivity) STEM contexts were positively associated with anticipated authenticity.

Studies 2 and 3 differed in whether experiential thought processes was a significant mediator. In Study 2, this indirect effect emerges alongside an indirect effect of anticipated experientiality whereas in Study 3 anticipated rationality was the only significant mediator. That rationality is particularly affected by integrated objectivity norms is further supported in the finding that integrated objectivity (vs. exclusive objectivity) increased anticipated capacity for mental agency but not human experience in Study 3. Yet, the contrast analyses in both studies indicate that the indirect effect of experiential thought processes did not differ from the indirect effect of rational thought processes. Together, these

findings demonstrate that anticipating both rational and experiential thought processes can be routes to expecting to feel authentic in STEM contexts, though rationality is descriptively stronger across both studies.

Yet, that the STEM objectivity norms had a stronger effect on anticipated rationality is surprising. One possible explanation for this pattern could be that considering entering the integrated context decreased evaluative concerns for participants, leading them to feel less threatened about engaging in rational thought processes within this STEM context. Another possibility for the stronger effects on rationality may lie in the wording of the rationality items. These items were drawn from existing measures to ensure the use of reliable and previously validated scales (Pacini & Epstein, 1999). However, the rationality items in particular seem to have an implication of emotionality as many of them start with phrases such as "I would enjoy", "I would prefer", or "I would feel." From this perspective, the greater motivation to engage in rational thought processes fostered by the integrated condition may stem, in part, from allowing people to consider the subjective experience of rational thought. In other words, these items may capture some of the integration of rational and experiential thought processes targeted by the context described.

Theoretical Implications

The present studies expand the SAFE model's understanding of fit and authenticity as rooted in the context (Schmader & Sedikides, 2018). A core component of the SAFE model is that people's chronic self-concepts will interact with their environment to shape whether people feel authentic in a given context. Here, that people expected to engage in thought processes aligned with the norms outlined in each STEM context is consistent with SAFE model notions of fit as an outcome of the environmental impact on the self. Yet, the studies here demonstrated strong and consistent contextual effects but no consistent moderation by individual differences in rationality or experientiality. Together, these findings provide partial support for the processes outlined in the SAFE model but suggest that its current notions

of fit may need to be expanded to consider a broader sense of fit that allows for a range of people, across chronic self-concepts, to feel authentic.

Additionally, the current findings build on self-in-context approaches to social psychology (e.g., Markus & Kitayama, 2010). As predicted by this model, contextual norms shaped beliefs about the types of thought processes that would be enacted in STEM contexts that were aligned with exclusive vs. integrated STEM objectivity norms. Yet, because people recreate and reinforce culture (Markus & Kitayama, 2010), as people engage with these STEM cultural contexts, they can act as reinforcers of these objectivity norms in STEM. Because the current research demonstrates the effects of contextual norms on anticipated thought processes, it also highlights the possibility that individuals might recreate this culture by acting in ways that uphold those norms. Thus, the culture shapes aspects thought processes which, in turn, can further the culture.

This work builds on the authenticity literature by demonstrating that authenticity can be a context-dependent state rather than merely a chronic disposition. Traditionally, research has investigated the impact of a stable, individual-difference authenticity (e.g., Goldman & Kernis, 2002; Sheldon et al., 1997). However, recently there has been a push for consideration of a state-based authenticity (Schmader & Sedikides, 2018; Sedikides et al., 2017). Because this conceptualization is relatively new, it has been explored in very few empirical studies. Those studies that have investigated a state authenticity have used recall tasks designed to elicit momentary authenticity or inauthenticity (Gino et al., 2015). The present dissertation thus builds on that research through highlighting that contextual norms can affect anticipated experiences of state authenticity. Because these perceived norms can emerge through recurring observation of people within the role (Koenig & Eagly, 2014), this research suggests that norms can be a signal from the role of whether one's ability to be themselves is afforded by a particular context.

Practical Implications

The present work expands on prior critiques of objectivity norms by identifying the absence of subjectivity as the issue with STEM culture norms. Objectivity is often viewed as hallmark of the Western scientific process, relying on the scientific method, with its focus on empirical observation and hypothesis testing, and positioning scientists as agents for confronting and discovering objective truths about the world (i.e., Positivism; McNamee, 2005; Ray, 1979). This objectivity in the process of science has long been critiqued by many scholars outside of science (e.g., Haraway, 1988; Subramaniam, 2014). Yet, the current findings suggest a more nuanced perspective. Here, these studies emphasize the benefits of creating spaces wherein *both* objectivity and subjectivity play a role in the culture and training of scientists. Specifically, these studies elucidate that it is not objectivity per se that creates problems for people's (anticipated) experiences in STEM contexts but rather exclusive objectivity at the expense of subjectivity. These studies thus highlight the potential psychological benefits of explicitly allowing subjectivity to co-exist alongside objectivity in STEM environments.

Further, these findings highlight how explicitly creating space for the coexistence of objectivity and subjectivity can foster belonging and well-being for a variety of people in STEM contexts. One critique of objectivity norms in science is that they merely represent the perspective of the dominant group in STEM (historically white men), excluding the perspectives of marginalized and underrepresented groups (Subramaniam, 2014). Such perceptions could contribute to the gap in participation in STEM careers for people from those backgrounds relative to white men. Yet, my Study 1 data refute a "pure objectivity" view of stereotypes in science, suggesting that there is more nuance in baseline beliefs about the presence of objectivity and subjectivity in STEM contexts than other scholars have acknowledged. Further, the integrated objectivity norms condition in Studies 2 and 3 demonstrate that people anticipate experiencing a psychological benefit from STEM contextual norms that are better aligned with this nuanced image of STEM. The cooccurrence of objectivity and subjectivity in STEM

environments heightened expected authenticity, belonging, and well-being regardless of social groups with which participants identified. Thus, this work provides a potential path forward by demonstrating that making the integration of alternative perspectives a prevailing norm of STEM can be beneficial across social identities.

Limitations and Future Directions

In these studies, expanding the norms surrounding the integration of subjectivity with objectivity elicited beliefs that people could be themselves and belong in these STEM contexts. One question that emerges from this work then, is whether it is expansiveness (generally) or expansiveness around *these* dimensions that would be expected to foster greater state authenticity in STEM. In other work, the perception of multiple options matters particularly when those options evoke intrinsic interest (Harackiewicz & Sansone, 1991) and fulfill fundamental motives (Benson-Greenwald & Diekman, 2021). From this perspective, I would expect expansiveness in departmental framing to foster authenticity, with its links to the self and intrinsic motivation (Ryan & Deci, 2000), only when that expansiveness targets intrinsic values or goals. Thus, it will be crucial in future work to examine the boundaries of expansive framings on authenticity.

In integrated contexts, people expected to be able to engage in a range of thought processes, both rationality and experientiality. Yet, it is likely that STEM contexts that integrate subjectivity can evoke other beliefs, particularly those that have been linked to greater interest and belonging in STEM career pathways. One future line of work might investigate whether the integration of subjectivity in STEM norms signals that there are opportunities to fulfill prosocial and humanitarian goals in science (i.e., communal goals). It is possible that one function of subjectivity in science is that it pushes people to think beyond the basic theoretical aspects of the science to consider the broader impacts. Thus, the explicit integration of subjectivity may highlight the availability of communal opportunities in science which, in turn, can increase interest in STEM majors and careers (Diekman et al., 2011, 2020). Another

line of work could explore the impact of these different STEM objectivity norms on trust in the department and expectations that one will be treated fairly. In organizations, women trusted companies that communicate norms surrounding the malleability of intelligence (i.e., growth mindset) more than those that communicated norms that intelligence is innate (i.e., fixed mindset; Emerson & Murphy, 2015). One possibility, then, is that that the integrated objectivity condition also signals a growth orientation, allowing for emotions of frustration and experiences with difficulty to be acceptable and expected. Following this reasoning, STEM departments that communicate norms that integrate both objectivity and subjectivity could foster trust in these departments, particularly for those who are the target of negative stereotypes surrounding science and math ability (i.e., white women and women and men of color), through signaling a growth-oriented organizational culture. Though the current studies do not find moderation by underrepresented status (i.e., women), it is possible that differences may emerge along the dimension of trust given that trust involves putting one's fate in the hands of others for particular outcomes and, therefore, trust may be more sensitive to status and power differences that tend to align with underrepresented status. I hope that the current research can lay the foundation for future inquiries examining the benefits of integrating subjectivity into STEM contexts.

The current work demonstrated that STEM objectivity norms can influence the range of thought processes people expect to be able to engage with in these contexts. A question remains as to whether these norms can also shape inferences about the range of *who* people expect to engage with in these STEM departments. Put simply, the explicit integration of subjectivity in STEM contexts may yield expectations about who the faculty in these departments are – what is the type of person who values integrating objectivity and subjectivity? Similarly, these norms might foster beliefs about the fellow students in this department – what is the type of person that is attracted to environments that wants to be in a department with these values? One function of norms is to foster cohesion among a group of people (Cialdini & Trost, 1998). Further, feminist and decolonizing scholars have long posited that STEM

objectivity norms function to exclude the presence and perspectives of women and people of color (Subramaniam, 2014). Taken together, explicitly valuing subjectivity alongside objectivity in STEM cultural norms may foster perceptions that a department is heterogenous, made up of people from a range of groups and backgrounds. Perceiving a department as heterogeneous in makeup should logically also yield identity safety for those who are more likely to experience stigma in STEM environments (Murphy et al., 2007), perhaps even disrupting perceptions of a masculine-coded, competition-based culture (i.e., masculinity-contest cultures; Vial et al., 2022) . Further, these norms may be perceived as promoting egalitarian attitudes more broadly, yielding transfer of identity safety (Chaney et al., 2016). Thus, the integration of subjectivity into STEM norms can offer a promising route toward promoting diversity, equity, and inclusion in ways that do not tokenize numerical representation but rather support the harmonization of different perspectives and experiences.

Another limitation of the present work is that these processes were investigated only with regard to STEM contexts. Yet, I would anticipate that these norms-to-authenticity affects would generalize to other contexts. For example, the legal context is another domain in which objectivity is highly valued (e.g., Patterson, 2001) and I would, therefore, expect those norms to similarly exert influence on anticipated thought processes, state authenticity, and belonging/well-being. In contrast, integrating objectivity in norms for predominately subjective spaces (e.g., art and cooking) might be useful for signaling belonging to those who are just starting out in these domains by providing initial criteria to gauge progress toward mastery in these subjects. Yet, the processes studied here could have implications for other cultural norms. Broadly speaking, this project demonstrates that norms can signal whether one can feel that they can be authentic in a given context. Thus, future work would do well to investigate these processes by examining the impact of other cultural norms on the self and belonging and well-being.

Conclusion

Seeing that subjectivity is valued in STEM contexts along with objectivity can communicate that people are able to be themselves in those departments. The *process* of science benefits when objectivity is highly valued to serve the goals of transparency and replicability. Yet, the *people* of science can benefit when the co-existence of subjectivity is similarly valued in STEM cultures by allowing a range of scientists' perspectives and experiences to be an important component of science.

References

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*(3), 497–529. https://doi.org/10.1037/0033-2909.117.3.497

Belanger, A. L., Joshi, M. P., Fuesting, M. A., Weisgram, E. S., Claypool, H. M., & Diekman, A. B. (2020). Putting belonging in context: Communal affordances signal belonging in STEM. *Personality and Social Psychology Bulletin*. https://doi.org/10.1177/0146167219897181

Benson-Greenwald, T. M., & Diekman, A. B. (2021). In the Mindset of Opportunity: Proactive Mindset, Perceived Opportunities, and Role Attitudes. *Personality and Social Psychology Bulletin*, 01461672211051488. https://doi.org/10.1177/01461672211051488

Carli, L. L., Alawa, L., Lee, Y., Zhao, B., & Kim, E. (2016). Stereotypes about gender and science: Women ≠ scientists. *Psychology of Women Quarterly*, *40*(2), 244–260. https://doi.org/10.1177/0361684315622645

Chaney, K. E., Sanchez, D. T., & Remedios, J. D. (2016). Organizational Identity Safety Cue Transfers. *Personality and Social Psychology Bulletin*, *42*(11), 1564–1576. https://doi.org/10.1177/0146167216665096

Chen, X., & Weko, T. (2009). *Chen, X., & Weko, T. (2009). Students who study science, technology, engineering, and mathematics (STEM) in postsecondary education. U.S. Department of Education, National Center for Education Statistics.*

Cheryan, S., & Markus, H. R. (2020). Masculine defaults: Identifying and mitigating hidden cultural biases. *Psychological Review*, *127*(6), 1022–1052. https://doi.org/10.1037/rev0000209

Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 2, pp. 151–192). Oxford University Press.

Cooper, J., & Fazio, R. H. (1984). A New Look at Dissonance Theory. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 17, pp. 229–266). Academic Press.

Diekman, A. B., Clark, E. K., Johnston, A. M., Brown, E. R., & Steinberg, M. (2011). Malleability in communal goals and beliefs influences attraction to STEM careers: Evidence for a goal congruity perspective. *Journal of Personality and Social Psychology*, *101*(5), 902. http://dx.doi.org/10.1037/a0025199

Diekman, A. B., Joshi, M. P., & Benson-Greenwald, T. M. (2020). Goal congruity theory: Navigating the social structure to fulfill goals. In B. Gawronski (Ed.), *Advances in Experimental Social Psychology* (Vol. 62, pp. 189–244). Academic Press. https://doi.org/10.1016/bs.aesp.2020.04.003

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R. (2010). New Well-being Measures: Short Scales to Assess Flourishing and Positive and Negative Feelings. *Social Indicators Research*, *97*, 143–156.

Emerson, K. T. U., & Murphy, M. C. (2015). A company I can trust? Organizational lay theories moderate stereotype threat for women. *Personality and Social Psychology Bulletin*, *41*(2), 295–307. https://doi.org/10.1177/0146167214564969

Erickson, R. J. (1994). Our society, our selves: Becoming authentic in an inauthentic world. *Advanced Development Journal*, *6*(1), 27–39.

Erickson, R. J. (1995). The importance of authenticity for self and society. *Symbolic Interaction*, *18*(2), 121–144.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. https://doi.org/10.3758/BF03193146

Fuesting, M. A., Diekman, A. B., Boucher, K. L., Murphy, M. C., Manson, D. L., & Safer, B. L. (2019). Growing STEM: Perceived faculty mindset as an indicator of communal affordances in STEM. *Journal of Personality and Social Psychology*, *117*(2), 260–281. https://doi.org/10.1037/pspa0000154

Gardner, W. L., Pickett, C. L., & Brewer, M. B. (2000). Social Exclusion and Selective Memory: How the Need to belong Influences Memory for Social Events. *Personality and Social Psychology Bulletin*, *26*(4), 486–496. https://doi.org/10.1177/0146167200266007

Germar, M., & Mojzisch, A. (2019). Learning of social norms can lead to a persistent perceptual bias: A diffusion model approach. *Journal of Experimental Social Psychology*, *84*, 103801. https://doi.org/10.1016/j.jesp.2019.03.012

Gino, F., Kouchaki, M., & Galinsky, A. D. (2015). The Moral Virtue of Authenticity: How Inauthenticity Produces Feelings of Immorality and Impurity. *Psychological Science*, *26*(7), 983–996. https://doi.org/10.1177/0956797615575277

Goldman, B. M., & Kernis, M. H. (2002). Role of Authenticity in Healthy Psychological Functioning and Subjective Well-being. *Annals of the American Psychotherapy Association*, *5*, 18–20.

Good, C., Rattan, A., & Dweck, C. S. (2012). Why do women opt out? Sense of belonging and women's representation in mathematics. *Journal of Personality and Social Psychology*, *102*(4), 700–717. https://doi.org/10.1037/a0026659

Gray, H. M., Gray, K., & Wegner, D. M. (2007). Dimensions of Mind Perception. *Science*, *315*(5812), 619–619. https://doi.org/10.1126/science.1134475

Gray, K., Knobe, J., Sheskin, M., Bloom, P., & Barrett, L. F. (2011). More than a body: Mind perception and the nature of objectification. *Journal of Personality and Social Psychology*, *101*(6), 1207–1220. https://doi.org/10.1037/a0025883

Harackiewicz, J. M., & Sansone, C. (1991). Goals and intrinsic motivation: You can get there from here. *Advances in Motivation and Achievement*, *7*, 21–49.

Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, *14*(3), 575–599. https://doi.org/10.2307/3178066

Koenig, A. M., & Eagly, A. H. (2014). Evidence for the social role theory of stereotype content: Observations of groups' roles shape stereotypes. *Journal of Personality and Social Psychology*, *107*, 371–392. https://doi.org/10.1037/a0037215

Markus, H. R., & Kitayama, S. (2010). Cultures and Selves: A Cycle of Mutual Constitution. *Perspectives on Psychological Science*, *5*(4), 420–430. https://doi.org/10.1177/1745691610375557

Markus, H. R., & Wurf, E. (1987). The Dynamic Self-Concept: A Social Psychological Perspective. *Annual Review of Psychology*, *38*(1), 299–337.

McConnell, A. R., Brown, C. M., & Shoda, T. M. (2013). The Social Cognition of the Self. In D. E. Carlston (Ed.), *Oxford Handbook of Social Cognition* (pp. 497–516). Oxford University Press.

McNamee, M. (2005). Positivism, Popper, and Paradigms: An Introductory Essay in the Philosophy of Science. In *Philosophy and the Sciences of Exercise, Health and Sport: Critical Perspectives on Research Methods* (pp. 1–19). Routledge.

Mehta, N. (2011). Mind-body dualism: A critique from a health perspective. *Mens Sana Monographs*, *9*(1), 202–209.

Muenks, K., Canning, E. A., LaCosse, J., Green, D. J., Zirkel, S., Garcia, J. A., & Murphy, M. C. (2020). Does my professor think my ability can change? Students' perceptions of their STEM professors'

mindset beliefs predict their psychological vulnerability, engagement, and performance in class. *Journal of Experimental Psychology: General*. https://doi.org/10.1037/xge0000763

Murphy, M. C., Steele, C. M., & Gross, J. J. (2007). Signaling Threat: How Situational Cues Affect Women in Math, Science, and Engineering Settings. *Psychological Science*, *18*(10), 879–885. https://doi.org/10.1111/j.1467-9280.2007.01995.x

Pacini, R., & Epstein, S. (1999). The Relation of Rational and Experiential Information Processing Styles to Personality, Basic Beliefs, and the Ratio-Bias Phenomenon. *Journal of Personality and Social Psychology*, *76*(6), 16.

Patterson, D. (2001). Normativity and objectivity in law. *William & Mary Law Review*, *43*(1), 325–363.

Pickett, C. L., & Gardner, W. L. (2005). The Social Monitoring System: Enhanced Sensitivity to Social Cues as an Adaptive Resonse to Social Exclusion. In *The Social Outcast: Ostracism, Social Exclusion, Rejection, and Bullying* (pp. 213–226). Psychology Press.

Prentice, D. A., & Carranza, E. (2002). What Women and Men Should Be, Shouldn't be, are Allowed to be, and don't Have to Be: The Contents of Prescriptive Gender Stereotypes. *Psychology of Women Quarterly*, *26*(4), 269–281. https://doi.org/10.1111/1471-6402.t01-1-00066

Prentice, D. A., & Carranza, E. (2004). Sustaining cultural beliefs in the face of their violation: The case of gender stereotypes. *The Psychological Foundations of Culture*, 259–280.

Pronin, E., Steele, C. M., & Ross, L. (2004). Identity bifurcation in response to stereotype threat: Women and mathematics. *Journal of Experimental Social Psychology*, *40*(2), 152–168.

Ray, L. J. (1979). Critical Theory and Positivism: Popper and the Frankfurt School. *Philosophy of the Social Sciences*, *9*(2), 149–173. https://doi.org/10.1177/004839317900900202

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–78.

Schmader, T., & Sedikides, C. (2018). State authenticity as fit to environment: The implications of social identity for fit, authenticity, and self-segregation. *Personality and Social Psychology Review*, *22*, 228–259. https://doi.org/10.1177/1088868317734080

Sedikides, C., Letitia Slabu, Alison Lenton, & Sander Thomaes. (2017). State Authenticity. *Current Directions in Psychological Science*, *26*(6), 521–525. https://doi.org/10.1177/0963721417713296

Sheldon, M., Ryan, R. M., & Rawsthorne, L. J. (1997). Trait Self and True Self: Cross-Role Variation in the Big-Five Personality Traits and Its Relations With Psychological Authenticity and Subjective Well-Being. *Journal of Personality and Social Psychology*, *73*(6), 1380–1393.

Shelton, J. N., Richeson, J. A., & Salvatore, J. (2005). Expecting To Be the Target of Prejudice: Implications for Interethnic Interactions. *Personality and Social Psychology Bulletin*, *31*(9), 1189–1202. https://doi.org/10.1177/0146167205274894

Sherif, M. (1935). A study of some social factors in perception. *Archives of Psychology (Columbia University)*, *187*, 60–60.

Sherif, M., & Sherif, C. W. (1953). *Groups in harmony and tension; an integration of studies of intergroup relations*. Harper & Brothers.

Subramaniam, B. (2014). Through the Prism of Objectivity: Dispersions of Identity, Culture, Science. In *Ghost Stories for Darwin* (pp. 159–179). University of Illinois Press.

Uhlmann, E. L., & Cohen, G. L. (2007). "I think it, therefore it's true": Effects of self-perceived objectivity on hiring discrimination. *Organizational Behavior and Human Decision Processes*, *104*(2), 207–223. https://doi.org/10.1016/j.obhdp.2007.07.001

Vial, A. C., Muradoglu, M., Newman, G. E., & Cimpian, A. (2022). An Emphasis on Brilliance Fosters Masculinity-Contest Cultures. *Psychological Science*, *33*(4), 595–612. https://doi.org/10.1177/09567976211044133

Walton, G. M., & Brady, S. T. (2017). The many questions of belonging. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of Competence and Motivation, Second Edition: Theory and Application* (2nd ed., pp. 272–293). Guilford Publications.

Weick, M., & Guinote, A. (2008). When subjective experiences matter: Power increases reliance on the ease of retrieval. *Journal of Personality and Social Psychology*, *94*(6), 956–970. https://doi.org/10.1037/0022-3514.94.6.956

Williams, K. D., & Nida, S. A. (2011). Ostracism: Consequences and Coping. *Current Directions in Psychological Science*, *20*(2), 71–75. https://doi.org/10.1177/0963721411402480

World Health Organization. (1948). *World Health Organization Constitution*. World Health Organization.

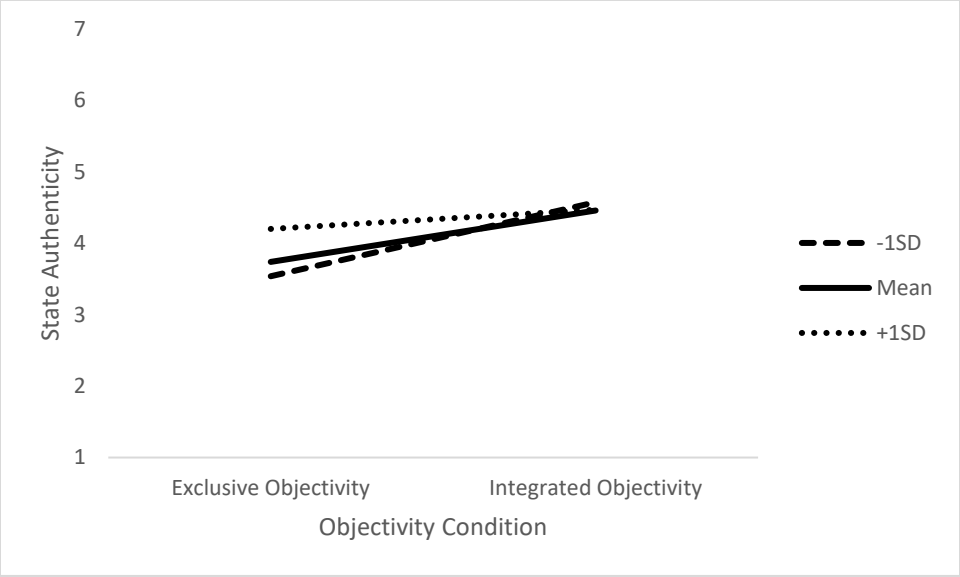
Appendix 1. Supplementary Analyses – Trait Rationality & Experientiality

In Studies 2 and 3, measures of trait rationality and experientiality as a core component of my initial theorizing drew on the importance of chronically accessible beliefs about the self. Specifically, early questions were raised about for whom exclusive objectivity norms might yield state authenticity, suggesting that trait levels of rationality and experientiality might moderate my proposed effects. Models tested included three-way moderation (with Trait Rationality, Trait Experientiality, and Objectivity Condition) and simpler, two-way moderation (with either Trait Rationality or Trait Experientiality and Objectivity Condition) which yielded mostly non-significant effects (*p*s > .24, βs < -0.12) across both studies. In Study 2, there was one significant moderation effect involving trait rationality. For transparency these results are reported below.

Study 2

I conducted multiple linear regression analyses to determine whether individual differences in rational thought processes moderated the effect of objectivity condition on state authenticity. State authenticity was regressed on dummy coded objectivity condition (0 = exclusive objectivity, 1 = integrated objectivity), mean centered trait rationality, and their interaction (all entered simultaneously). This test of moderation was significant, b = -0.65, SE = .28, β = -0.22, p = .021. As shown in Figure S1, people who were at low or moderate levels of trait rationality, expected to experience greater state authenticity when they considered entering a STEM context that integrated objectivity and subjectivity (vs. exclusive objectivity). At high levels of trait rationality, there was no difference in anticipated authenticity between the integrated and exclusive objectivity conditions.

Figure S1. Moderation of Norms-to-State Authenticity by Trait Rationality



Note. Only the slopes for those low (-1 SD) and moderate in trait rationality are significant. *Low*: b = 1.04, SE = 0.26, β = 0.36, $p < .001$; *Mean*: b = 0.72, SE = 0.21, β = 0.25, $p < .001$; *High*: b = 0.27, SE = 0.26, β = 0.09, p = .31.

Appendix 2. Study 3 Human Capacities and Authenticity, Belonging, and Well-being Correlations

Study 2

Bivariate correlations among human capacities, thought processes, and state authenticity are presented in Table *S1.*

Table S1. Study 2 Bivariate correlations

	Rational Thought Processes	*Experiential Thought Processes*	*State Authenticity*
Mental Agency	.19**	.06	.33***
Human Experience	.06	-.01	.10

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Study 3

Bivariate correlations among human capacities, thought processes, state authenticity, and belonging and well-being are presented in Table S2.

Table S2. Study 3 Bivariate correlations

	Rational Thought Processes	*Experiential Thought Processes*	*State Authenticity*	*Belonging*	*Well-being*
Mental Agency	.23***	.25***	.28***	.44***	.52***
Human Experience	.15**	.05	.20***	.24***	.34***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

June 2022

Tessa M. Benson-Greenwald
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Education

Ph.D.	Indiana University
2022	Psychology
	Advisor: Amanda Diekman
	Dissertation: *Context and the Authentic Self: The Impact of Perceived of Perceived STEM Objectivity Norms on Self-Concept Beliefs and Well-Being*
M.A.	Miami University
2018	Social Psychology
	Advisor: Amanda Diekman
	Thesis: *The Light at the End of the Tunnel: Temporal Distancing and Academic Attitudes*
B.S.	Kutztown University of Pennsylvania, *summa cum laude*
2014	Psychology, Minor: Anthropology
	Advisor: Jason Lanter

Professional Appointments

2022- present	Post-Doctoral Associate, University of Pittsburgh
	Learning Research and Development Center
	Advisors: Brian Galla & Timothy Nokes-Malach

Honors and Awards:

2022	Spring 2022 Outstanding Graduate Student Instructor Award
2022	Spring 2022 IUB Provost's Travel Award for Women in Science
2022	International Twitter Poster Conference winner (Harry Potter and the magic of statistics)
2022	Society for Personality and Social Psychology Graduate Travel Award
2021	Fall 2021 Sharon Stephens Brehm Travel Award
2020	Spring 2020 Outstanding Graduate Student Instructor Award
2020	Spring 2020 IUB Provost's Travel Award for Women in Science
2019	Fall 2019 Sharon Stephens Brehm Travel Award
2019	Fall 2019 IUB College of Arts and Sciences Travel Award
2019	Spring 2019 IUB Provost's Travel Award for Women in Science
2018	Fall 2018 IUB Provost's Travel Award for Women in Science
2018	Fall 2018 Sharon Stephens Brehm Travel Award
2017	Society for Personality and Social Psychology Graduate Travel Award
2014	Excellence in Psychology for Independent Research Award
2014	Psi Chi

Grants

2017-2019	Office for the Advancement of Research and Scholarship, Miami University Diversity and Inclusion Grant, *A cross-cultural study of mental health stigma and help-seeking* (co-PIs: Sarah Dreyer-Oren and Anjali Jain) $7,500.

RESEARCH

Papers

Benson-Greenwald, T.M., Joshi, M.P., & Diekman, A.B. (2022). Out of the lab and into the world: Analyses of social roles and gender in media portrayals of science. *Frontiers in Psychology, 12.*

Benson-Greenwald, T.M., Trujillo, A., White, A.D., & Diekman, A.B. (2021). Science for others or the self? Presumed motives for science shape public trust in science. *Personality and Social Psychology Bulletin.*

Benson-Greenwald, T.M., & Diekman, A.B. (2021). In the mindset of opportunity: Proactive mindset, perceived opportunities, and role attitudes. *Personality and Social Psychology Bulletin.*

Light, A.E., **Benson-Greenwald, T.M.,** & Diekman, A.B. (2021). Gender representation cues labels of hard and soft sciences. *Journal of Experimental Social Psychology.*

Diekman, A.B., Joshi, M.P., & **Benson-Greenwald. T.M.** (2020). Goal congruity theory: Navigating the social structure to fulfill goals. In B. Gawronski (Ed.), *Advances in Experimental Social Psychology*.

Diekman, A.B., & **Benson-Greenwald, T.M.** (2018). Fixing STEM workforce and teacher shortages: How goal congruity can inform individuals and institutions. *Policy Insights from the Behavioral and Brain Sciences, 5,* 11-18. https://doi.org/10.1177/2372732217747889

Manuscripts Under Review

Joshi, M.P., **Benson-Greenwald, T.M.**, & Diekman, A.B. (under review). *Unpacking motivational culture: Diverging emphasis on communality and agency across STEM domains*

Block, K., Teresa Olsson, M.I., van Grootel, S., Meeussen, L., Van Laar, C., Martiny, S.E., Schuster, C., Shuyi Sun, M., Croft, A…. **Benson-Greenwald, T.M.,** …., Schmader, T. (under review). *Why is the gender gap in the care-economy larger in highly developed countries?*

Manuscripts in Preparation

Benson-Greenwald, T.M., Joshi, M.P., & Diekman, A.B. (in prep). *Communal experiences: How are they rooted in individual-level cognition and the surrounding environment?* Manuscript in progress.

Sarmal, A., **Benson-Greenwald, T.M.**, & Diekman, A.B. (in prep). *Dreaming of belonging: American Dream beliefs and belonging outcomes*. Manuscript in progress.

Sherman, J.E., **Benson-Greenwald, T.M.,** & Bernstein, M.J. (in prep). *Theorizing on institutional ostracism.* Manuscript in progress.

Invited Presentations

Benson-Greenwald, T.M., Trujillo, A., & Diekman, A.B. (2019, September). *Science for prosociality or power? Presumed motives for science shape public trust in science.* Colloquium presented to Social Area Professional Seminar, Pennsylvania State University, State College PA.

Benson-Greenwald, T.M., Diekman, A.B., & Winstel, M. (2017, January). *Proactive personality: The possibilities of reconstructing the STEM context*. Colloquium presented to Psychology and Social Sciences Area, Pennsylvania State University, Abington PA.

Research Presentations

Benson-Greenwald, T.M., & Diekman, A.B. (2022, April). *Perceived STEM objectivity norms affect self-concept beliefs and authenticity.* Oral presentation at the 93rd Annual Meeting of the Midwestern Psychological Association, Chicago, IL.

Benson-Greenwald, T.M., & Diekman, A.B. (2022, February). *Examining beliefs about the importance of objectivity and subjectivity in STEM contexts.* Poster presented at the 23rd Annual Society for Personality and Social Psychology Conference, San Francisco, CA.

Dreyer-Oren, S.E., Jain, A.T., **Benson-Greenwald, T.M.,** Raval, V.V., Diekman, A.B., & Clerkin, E.M. (2021, November). *Perceived burdensomeness and help-seeking attitudes: The role of race and residency status.* Poster presented at the 55th annual convention for the Association for Behavioral and Cognitive Therapies, (https://www.abct.org/2021-convention/).

Benson-Greenwald, T.M., & Diekman, A. (2021, April). *Proactive mindset shapes beliefs that majors and careers afford goals.* Paper accepted at the 92nd Annual Meeting of the Midwestern Psychological Association, http://midwesternpsych.org/2019-meeting/. content/uploads/sites/22/2020/03/MPA-2020-Program-1.pdf

Benson-Greenwald, T.M., Diekman, A.B., & Hugenberg, K. (2021, February). *Objective minds: Objectivity predicts self-perceived capacity for experience and agency.* Poster presented at the 22nd Annual Society for Personality and Social Psychology Conference. https://meeting.spsp.org/2021/

Sarmal, A., **Benson-Greenwald, T.M.,** & Diekman, A.B. (2021, February). *Dreaming of belonging: American dream beliefs and belonging outcomes.* Poster presented at the 22nd Annual Society for Personality and Social Psychology Conference. https://meeting.spsp.org/2021/

Benson-Greenwald, T.M., Joshi, M.P., & Diekman, A. (2020, February). *Out of the lab and into the world: Analyses of social roles and gender in media portrayals of science*. Poster presented at the 21st Annual Society for Personality and Social Psychology Conference, New Orleans, LA.

Joshi, M.P., **Benson-Greenwald, T.M.**, & Diekman, A. (2020, February). *Not all STEM: Varying goal opportunities reflect environmental cues within STEM domains*. Poster presented at the 21st Annual Society for Personality and Social Psychology Conference, New Orleans, LA.

Benson-Greenwald, T.M., Diekman, A., & Trujillo, A. (2019, April). ***Perceiving science as benefiting society predicts trust in science*. Oral presentation at the 91st Annual Meeting of the Midwestern Psychological Association, Chicago, IL.**

Benson-Greenwald, T.M., & Diekman, A. (2019, February). *The light at the end of the tunnel: Temporal distancing and academic attitudes*. Poster presented at the 20th Annual Society for Personality and Social Psychology Conference, Portland, OR.

Benson-Greenwald, T., O'Grady, R., & Diekman, A. (2018, April). *The scientist's perspective: Communicating valued goals and navigating roles*. Oral presentation at the 90th Annual Meeting of the Midwestern Psychological Association, Chicago, IL.

Benson-Greenwald, T., Winstel, M., & Diekman, A. (2018, March). *Proactive mindset: The possibilities of reconstructing the STEM context.* Poster presented at the 19th Annual Society for Personality and Social Psychology Conference, Atlanta, GA.

Benson-Greenwald, T.M., & Lanter, J.R. (2015, March). *Who drives the worst: Examining behavior based assumptions in the absence of a known group membership.* Poster presented at the 2015 Annual Meeting of the Eastern Psychological Association, Philadelphia, PA.

Benson-Greenwald, T.M., & Lanter, J.R. (2014, April). *Driving like a guy/girl: Examining gendered behavior based assumptions in the absence of a known actual gender.* Poster presented at the Ninth Annual Student Research Conference, Kutztown University, Kutztown, PA.

Teaching Presentations

Benson-Greenwald, T.M. (2021, October) *Harry Potter and the magic of statistics.* Poster presented at 20th Annual Conference on Teaching of the Society for the Teaching of Psychology & International Twitter Poster Conference, https://teachpsych.org/conferences/act.php

Student Presentations

Luu, A., Sherman, J.E., Levy, D.J., Hirt, E., Bernstein, M.J., & **Benson-Greenwald, T.M.** (2022, April). *Comparison of discrimination and ostracism.* Poster presented at the 93rd Annual Meeting of the Midwestern Psychological Association, Chicago, IL.

Pictor, L., Joshi, M., **Benson-Greenwald, T.M.**, Diekman, A. (2021, April). *How STEM environments influence perceived opportunities to help others.* Poster presented at the 2021 Women's Research Poster Competition, Bloomington, IN.

Samuels, H., **Benson-Greenwald, T.M.,** & Murphy, M.C. (2020, April). *How communal opportunities related to belonging and psychological well-being in STEM*. Poster accepted at the 92nd Annual Meeting of the Midwestern Psychological Association, Chicago, IL. http://midwesternpsych.org/wp-content/uploads/sites/22/2020/03/MPA-2020-Program-1.pdf (Conference canceled)

Samuels, H., **Benson-Greenwald, T.M.**, & Murphy, M.C. (2020, February). *Let's work together! The influence of communal goals on sense of belonging and psychological well-being for women in STEM*. Poster presented at the 21st Annual Society for Personality and Social Psychology Conference, New Orleans, LA.

Stone, C., Verghis, T., Yamada-Killilea, M., **Benson-Greenwald, T.,** Joshi, M., & Diekman, A. (2018, April). *Saving the world or ruling it?: Affordances of science predict trust toward science*. Poster presented at Annual Undergraduate Research Forum, Miami University, Oxford, OH.

Bryan, A., Fuesting, M., **Benson-Greenwald, T.,** & Diekman, A. (2018, April). *Investigating differential feedback to men and women.* Poster presented at the 90th Annual Meeting of the Midwestern Psychological Association, Chicago, IL.

Stone, C. **Benson-Greenwald, T.,** & Diekman, A. (2018, March). *What is science good for? Beliefs that science affords communal opportunities predict trust in science*. Poster presented at the Miami University Government Relations Poster Session, Washington, D.C.

Bryan, A., Fuesting, M., **Benson-Greenwald, T.**, & Diekman, A. (2017, April). *Benevolent sexism as a predictor of critical feedback.* Poster presented at Annual Undergraduate Research Forum, Miami University, Oxford, OH.

Campe, G., Kowalski, K., **Benson-Greenwald, T.,** Fuesting, M., & Diekman, A. (2017, April). *Reactions to mistakes: Discrepancies in preferences and expectations in STEM.* Poster presented at Annual Undergraduate Research Forum, Miami University, Oxford, OH.

Safer, B., Yamada-Killilea, M., Fuesting, M., **Benson-Greenwald, T.,** & Diekman, A. (2017, April). *Role models in STEM*. Poster presented at Annual Undergraduate Research Forum, Miami University, Oxford, OH.

Winstel, M., **Benson-Greenwald, T.**, Fuesting, M., Belanger, A., & Diekman, A. (2017, April). *Proactive personality and satisfaction in STEM fields.* Poster presented at Annual Undergraduate Research Forum, Miami University, Oxford, OH.

Teaching Experience

2019-2022 Instructor of Record, Indiana University
Undergraduate Statistical Techniques (PSY-K300), Spring 2021, Spring 2022
Social Psychology and Individual Differences (PSY-P304), Fall 2019

2018-2021 Teaching assistant, Indiana University
Laboratory in Social Psychology (PSY-P421), Fall 2021
Undergraduate Statistical Techniques (PSY-K300), taught by Cynthia Patton (Summer 2021)

	Undergraduate Statistical Techniques (PSY-K300), taught by Rick Hullinger (Fall 2020) *Cognitive Psychology* (PSY-P335), taught by Tom Gruenenfelder (Fall 2018)
2019-2020	Undergraduate Honors thesis mentor, Indiana University
2019-2020	Lab Instructor, Indiana University *Undergraduate Statistical Techniques* (PSY-K300), Spring 2019, Spring 2020, Fall 2020
2019	Guest Lecturer, Indiana University *Undergraduate Statistical Techniques* (PSY-K300): *Correlation*, Spring 2019
2018-2021	Teaching assistant, Indiana University *Undergraduate Statistical Techniques* (PSY-K300), taught by Cynthia Patton (Summer 2021) *Undergraduate Statistical Techniques* (PSY-K300), taught by Rick Hullinger (Fall 2020) *Cognitive Psychology* (PSY-P335), taught by Tom Gruenenfelder (Fall 2018)
2017	Lab Instructor, Miami University *Graduate Statistics: Regression* (PSY 601), Fall 2017
2017-2018	Guest Lecturer, Miami University *Introductory Social Psychology* (PSY 221): *Achievement and Gender*, Fall 2017 & Spring 2018 *Psychology of Gender* (PSY 326): *Gender and Achievement*, Fall 2017 *Undergraduate Statistics: Design and Analyses PSY II* (PSY 294): *Paired Samples T-Test,* Fall 2017 *Introductory Social Psychology* (PSY 221): *Aggression,* Spring 2017 *Introduction to Psychology* (PSY 111): *Social Psychology*, Spring 2017
2016-2017	Private tutor in statistics and methodology, Miami University
2016-2017	Undergraduate Honors thesis co-mentor, Miami University
2016	Teaching assistant, Miami University *Seminar in Gender, Work, and Leadership*, taught by Amanda Diekman (Fall 2016)

Service

2022	Ad hoc reviewer, *Frontiers in Psychology*
2022	Ad hoc reviewer, *Small Business Economics*
2018-2022	Diversity Advancement Committee Member, Indiana University
2018-2022	Graduate School Panel for Undergraduates, Indiana University
2019-2022	Social Area Seminar Coordinator, Indiana University Coordinate schedule of speakers (graduate students, faculty members, guest speakers) for weekly Social Area meetings
2021	Applicant Core Team member, Application Statement Feedback Program Provide feedback and editing support for PhD applicants' personal statements in psychology, emphasis on underrepresented minorities (more info: www.asfp.io)
2021	Ad hoc reviewer, *Sex Roles*
2020-2021	Sub-Committee Chair, Graduate Student Sub-Committee of the Diversity Advancement Committee, Indiana University
2019-2021	Recording Secretary, Diversity Advancement Committee, Indiana University Record and send out meeting minutes to other members
2019-2020	Sub-Committee Chair, Climate Survey Sub-Committee of the Diversity Advancement Committee, Indiana University
2020	Ad hoc reviewer, *British Journal of Educational Psychology*
2020	Ad hoc reviewer, *Group Processes & Intergroup Relations*
2020	Ad hoc reviewer, *Journal of Social Issues*
2019-2020	Honors thesis mentor: Hannah Samuels

2019-2020 Honors Thesis Panel for Undergraduates, Indiana University
2018-2019 Groups STEM Graduate Student Mentor, Indiana University
2017-2018 Social Area Interview Day Coordinator, Miami University
Coordinate prospective graduate students' and faculty members' schedules; Delegate responsibilities to other social area graduate students
2017 Social Area Representative, Working Committee on Not Working, Miami University
Organize social events for graduate students across the Psychology Department areas
2016-2018 Graduate School Panel for Undergraduates, Miami University
2016-2017 Honors thesis Co-mentor: Maggie Winstel
2016-2017 Department of Psychology Representative, Graduate Student Association, Miami University

Professional Affiliations

2021-2022 Society for the Teaching of Psychology
2018-2022 Association for Psychological Science
2016-2022 Society for Personality and Social Psychology
2016-2022 Midwestern Psychological Association
2014-2022 Psi Chi Psychology Honors Society
2012-2022 Eastern Psychological Association