Meaning-Maintenance as a Learning Strategy: Predictions for How Expectation Violations Can Influence Classroom Learning

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Abstract:

The use of counterintuitive findings in the classroom has the benefit of being memorable to students. However, there might be other benefits to using counterintuitive examples in the classroom. The Meaning Maintenance Model (Heine, Proulx, & Vohs, 2006) suggests that counterintuitive phenomena, or phenomenon that violate our expectations, lead to a variety of compensatory responses. These compensatory responses might be harnessed by teachers in the classroom to the benefit of student learning. Counterintuitive phenomenon should motivate students to affirm (strengthen), abstract (recognize), and/or assemble (create) meaning in order to regain a sense of meaning and the familiarity. Four empirically testable hypotheses are suggested, which are specific to classroom learning. Future questions and caveats are also discussed.

Key Words:

Meaning maintenance model, counterintuitive, meaning, affirmation, abstraction, assembly, learning, classroom.

Introduction

Like many instructors, I often teach students about a counterintuitive finding to get them more involved in the class. It engages students and makes the topic—and the class—more memorable. Indeed, these counterintuitive examples are often what students comment to me about as being the most memorable of the course. Consistent with these anecdotes, a variety of research over several decades suggests that counterintuitive ideas are better remembered, which is sometimes called the von Restorff effect, distinctiveness effect, or minimal counterintuitiveness effect (e.g., von Restorff, 1933; Barrett, 2000; Boyer, 1994). However, there might be other benefits to using counterintuitive examples in teaching. Counterintuitive phenomena, or phenomenon that violate our expectations, have been found to lead to a variety of compensatory responses (e.g., Proulx & Heine, 2009). These somewhat predictable responses leave open the possibility that they can be harnessed by instructors to the advantage of students' learning. In this paper, I outline many of these potential benefits, suggest four testable hypotheses, and discuss some remaining questions and caveats.

A Sense of Meaning

People establish meaning by forming expectations and associations about the world (e.g., the sun is hot, snow is cold, you will be taught about social psychology in a social psychology class, etc.). Meaning through associations can also be demonstrated in instances that are meaningful for some people but not for others. For instance, abstract art is meaningful to people who can form associations with the content, but for others, abstract art is an assortment of random colours and shapes with no apparent associations between the elements or other concepts, and hence not meaningful. The Meaning Maintenance Model (MMM; Heine, Proulx, & Vohs, 2006) suggests that when we are confronted with something unexpected—termed a "meaning violation"—we feel a kind of uneasiness or lack of familiarity. Experiencing uneasiness from meaning violations is not a new idea. It has been around in psychology since at least Freud's time, though it has gone by different names. It has been described as an uncanny feeling by Freud (1919), a feeling of absurdity by Camus (1942), disequilibrium by Piaget (1952), dissonance by Festinger (1957), and anxiety by Kuhn (1962). To assuage the resulting uneasy feeling, we attempt to restore a more familiar, meaningful experience. We accomplish this goal through several means.

The first two means are familiar to developmental and learning researchers: "assimilation" and "accommodation". Jean Piaget (1952) suggested that children learn associations by assimilating information into their existing meaning frameworks, called schemata, or accommodating information by creating new associations. For example, when a child first sees a zebra, she might label it a horse, assimilating it into her "horse" schema. However, when told it is a zebra, the child will likely accommodate the information into a new "zebra" schema. These two processes allow our meaning frameworks to grow as we gain expected associations from our experiences.

However, these are not the only responses that occur when our expected associations are not met. There are at least three other processes, which are often referred to as compensatory because they can seemingly have little or nothing in common with the meaning violation (e.g., Heine, Proulx, & Vohs, 2006): "Affirmation"

involves strengthening existing meaning, "abstraction" involves seeking out new meaning, and "assembly" involves creating meaning. Affirmation has by far the most research, followed by abstraction, and finally by assembly. Each of these will be discussed in turn.

After a meaning violation, people are more likely to affirm their existing expectations to regain a feeling of the familiarity. Interestingly, affirmation can occur in domains that are unrelated to the area where a violation occurred, termed "fluid compensation" (Steele, 1988). For instance, an existential meaning violation (i.e., being reminded of one's own inevitable mortality) led natural science students to more staunchly support a theory that was consistent with natural science (i.e., evolutionary theory) over one that was not (i.e., intelligent design theory), thus affirming a part of their belief system that was not directly relevant to the violation (Tracy, Hart, & Martens, 2011). This tendency to affirm unrelated meaning after a meaning violation can likely be harnessed in the classroom. After a meaning violation, students should be motivated to affirm something else that they have already learned. For example, after a meaning violation, teachers could review a concept that was previously learned correctly in class, thus giving students opportunities to affirm this meaning framework and solidify the concept in their minds. If students already learned about cognitive schemata, as an example, then after a meaning violation the teacher could review this concept, and thus give students the opportunity to affirm and solidify the concept. As another example, after a meaning violation, students should be more likely to affirm aspects of their identity (i.e., self-schemata; Markus, 1977), such as their identity as students, which might be of benefit to teachers when seeking more commitment from students.

These findings lead to hypothesis 1: Classroom meaning violations are expected to lead to a strengthening of students' existing meaning frameworks.

Abstraction involves finding new associations to regain a feeling of the familiarity. It often manifests as pattern recognition. Although new associations are not familiar in the sense that they have been known for some time (i.e., they are new and not previously known), experiencing meaning in general is likely to be a familiar feeling since our experiences tend to be association-heavy and meaningful. Indeed, several theories, such as Kelley's Personal Construct Theory (1955), assume that people are constantly attempting to make and maintain meaning as they navigate their environments, such as forming expectations and making predictions about the world. Consistent with abstraction following meaning violations, work by Proulx and Heine (2009) found that participants were more likely to learn a difficult-to-discern pattern following a meaning violation, and Whitson and Galinsky (2008) found that meaning violations led participants to perceive patterns, such as images in noise. In a classroom setting, if the goal is for students to identify patterns, which is necessary for common tasks such as learning grammar, then meaning violations should increase the success of identifying such patterns. In this way, increasing pattern recognition could be a benefit for students.

These findings lead to hypothesis 2: Classroom meaning violations are expected to lead to better pattern recognition by students.

Assembly involves creating a new meaningful experience. This is similar to abstraction in that something previously unfamiliar becomes familiar, but instead of pattern recognition, assembly involves works of creativity, and thus can be measured with creativity tasks. This area has received considerably less research than the other areas previously mentioned. However, there is considerable historical evidence in support of these claims. Artistic contributions have been associated with periods of meaning violations. As one example, classic work by Russian authors such as Dostoevsky during the struggles of 19th century Russia (Frank, 1996). More empirically, one study found that some participants who experienced a meaning violation showed an increase in creativity (Routledge & Juhl, 2012), and being exposed to different cultures tends to increase creativity (Maddux, Adam, & Galinsky, 2010). Exposure to new and highly different cultures often floods travelers with countless meaning violations (e.g., new foods, unexpected customs, etc.), which can be experienced as cultural shock (Oberg, 1960)—an unpleasant state where travelers struggle to form meaningful associations with the host culture. In the classroom, increasing assembly after a meaning violation could be of interest to teachers where creating novel links with material is desirable, such as with tasks that require creativity.

These findings lead to hypothesis 3: Classroom meaning violations are expected to increase student creativity.

Teachers, instructors, professors, and other pedagogical agents can likely use these various means of responding to meaning violations to their advantage in their teachings. By providing meaning violations (e.g., a counterintuitive finding), one can create a need to compensate in order to restore meaning and a sense of the familiarity. In addition to increasing memorability (von Restorff, 1933; Barrett, 2000; Boyer, 1994), if the goal is to have students strengthen their existing views, find patterns, or increase their creativity, appropriate use of meaning violations should increase the likelihood that these processes occur.

Further Questions

There remain a number of relevant questions about how to best apply the MMM to the classroom for the benefits of students' learning. Three questions that are of particular importance in the classroom are highlighted below. This is not meant as an exhaustive list. Rather, this list is more of a starting point for future work.

1) What meaning violations are appropriate for the classroom?

Any violation of our expectations can be considered a meaning violation; however, some violations might be less desirable than others in the classroom. For example, discussing one's own mortality is an existential meaning violation, and although hundreds of studies have primed people with thoughts of their own mortality (Burke, Martens, & Faucher, 2010) with seemingly no serious adverse side-effects, this meaning violation might be less than ideal in certain classroom settings without a proper introduction. Discussing one's own imminent death is likely to be an unpleasant

experience for many students in its own right, and particularly for those who have recently experienced a death of a loved-one. Fortunately, more benign meaning violations exist. A counterintuitive finding should suffice, but this has the drawback of not always being possible (i.e., some findings are simply not counterintuitive). Extant research can serve as a guide, which has used a variety of meaning violations, some of which include mismatched playing cards (e.g., a black heart instead of a red one; Proulx & Heine, 2006) and incongruent word pairs (e.g., quickly—blueberry versus juicy—blueberry; Randles, Proulx, Heine, 2011). These violations have the benefit of research support, but the drawback of not being readily applicable to a classroom setting.

2) How many meaning violations should be presented?

Most studies that have assessed compensatory responses have used a single meaning violation, which suggests that one meaning violation at a time should suffice in the classroom. There might be a desire to use more violations to strengthen the desired effect, but there is reason to believe that too many meaning violations might not have positive effects. One study on the memorability of concepts found that two to three counterintuitive elements were remembered best (Norenzayan, Atran, Faulkner, & Schaller, 2006). Remembering new concepts after a meaning violation is not the same thing as compensatory responses, but they might be related processes that work best with similar meaning violations. This is an empirical question that requires empirical support, but it seems like a single meaning violation or a minimal number of violations will suffice.

3) Given that there are different responses to violation expectations, how can we be sure which mechanism will kick in? In other words, when will abstraction, affirmation, or assembly be more likely to occur?

Past research has not specifically tested whether one mechanism trumps another. Some researchers have theorized that the self is likely to play a role (Zhu, Martens, & Aquino, 2012), but there is reason to believe that people are not overly picky in how they restore a sense of meaning. That is, people generally seem to take advantage of whatever mechanism is made available to them. Typical studies give participants an opportunity to abstract, affirm, or assemble (but not the opportunity to do all of them) after experiencing a meaning violation. Participants tend to take advantage of the available opportunity and use the mechanism that can restore meaning in the task provided. If people are not overly selective as to which process leads them to a feeling of familiarity and meaning, then teachers need only provide them with a task that requires the desired process. The current state of research suggests that it is reasonable to assume that people adopt the easiest, most readily available mechanism, suggesting that teachers should give students the opportunity to compensate in the way they deem fit.

These findings lead to hypothesis 4: Distinct compensatory responses are expected to be more or less likely depending on the available task.

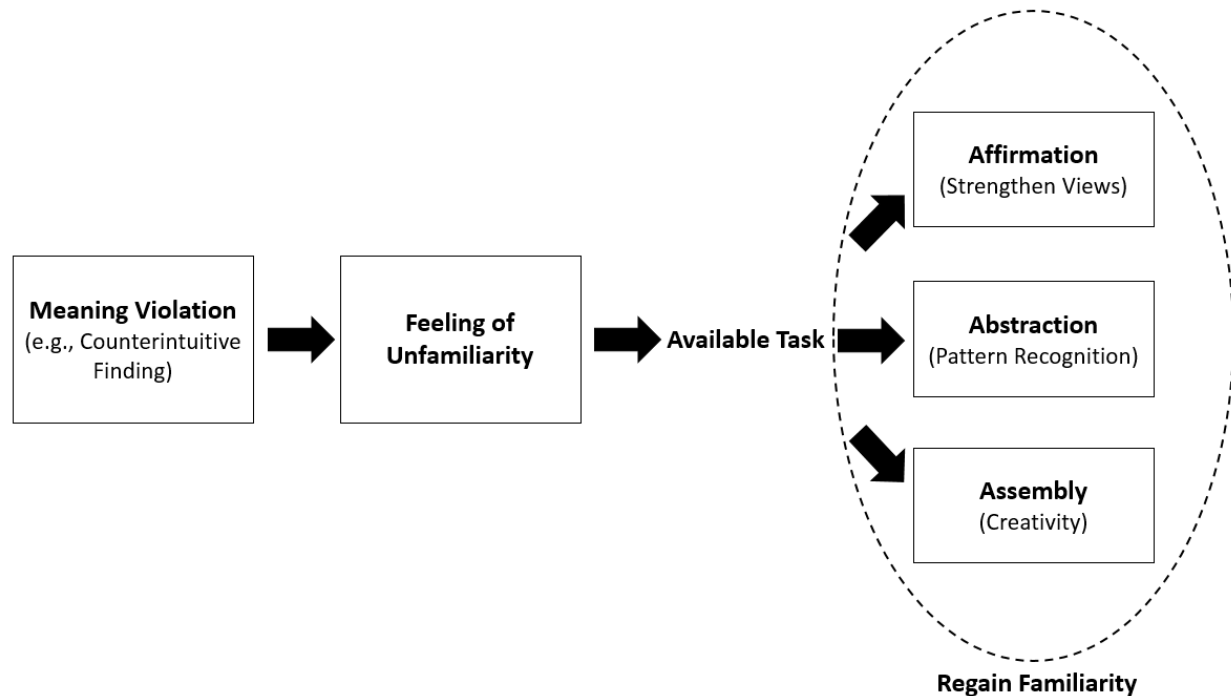The predictions and model are presented in Figure 1 below.

Figure 1. Meaning violations, such as a counterintuitive finding, will lead to a feeling of the unfamiliar, which will lead to a compensatory response to regain a sense of familiarity. Which compensatory response occurs will depend on which task is made available to students.

Caveats

At least two caveats should be mentioned. First, although there are theoretical and empirical reasons to assume meaning violations can have benefits in the classroom, this area remains untested scientifically. The hypotheses derived from the MMM are a first step in guiding empirical work to substantiate them, which should be conducted in a classroom setting.

Second, not all responses to meaning violations will necessarily be a benefit in the classroom. For example, although pattern recognition increases after meaning violations (e.g., Proulx & Heine, 2009), meaning violations also increase the perception of non-existent patterns. For instance, after a meaning violation, perceiving conspiracy theories and developing superstitions also increase (Whitson & Galinsky, 2009). Having students support conspiracy theories and superstitions is not typically a desirable outcome. Care should be taken to ensure that the tasks made available to students encourage desired pattern recognition, in this case, to minimize this potential outcome.

Concluding Remarks

Four testable hypotheses were derived from the Meaning Maintenance Model. These hypotheses suggest benefits for students' classroom learning. Indeed, there is a tremendous amount of potential to use the principles of the MMM in the classroom to take advantage of how people compensate for meaning violations. A current lack of

research in this specific realm means these are still untested hypotheses. However, given the laboratory studies demonstrating compensatory responses and the use of counterintuitive results in textbooks and classrooms, there is reason to believe that these manipulations are likely to be productive and should be relatively benign.

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