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Transforming Confirmation Bias to Generate Critical Consciousness in News/Information Literacy and Social Science Courses

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Transforming Confirmation Bias to Generate Critical Consciousness in News/Information Literacy and Social Science Courses

Abstract
This paper synthesizes theory and research on confirmation bias (CB), curiosity, and news/information literacy education with the goal of understanding how helping students critique their tendency to engage in CB spurs curiosity and critical consciousness about learning. Curiosity about the self is spurred when people realize their CB tendencies. Curiosity about the larger social world is spurred when students learn how CB affects the way they look at the world. A flipped classroom approach reflects the work of Paulo Freire, who argued critical education should be experiential with faculty playing a facilitating, rather than an "expert" role.

Cet article présente une synthèse de la théorie et de la recherche sur les préjugés de confirmation, la curiosité et la littératie des nouvelles/des informations avec pour objectif la compréhension de la manière dont on peut aider les étudiants à critiquer leurs tendances à participer pour stimuler la curiosité concernant les préjugés de confirmation et la conscience critique relativement à l'apprentissage. La curiosité à propos de soi est stimulée quand les gens se rendent compte de leurs tendances à avoir des préjugés de confirmation. La curiosité à propos du monde social plus vaste est stimulée lorsque les étudiants apprennent comment les effets des préjugés de confirmation affectent la manière dont ils voient le monde. Une approche basée sur la salle de classe interactive reflète le travail de Paulo Freire, qui estime que l'éducation critique devrait être basée sur une expérience et où les professeurs tiennent un rôle d'animateurs et non pas d'«experts ».

Keywords
confirmation bias, curiosity, critical information literacy, social science courses, higher education; préjugés de confirmation, curiosité, littératie critique des nouvelles, cours de sciences sociales, enseignement supérieur

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In many ways, education can be viewed as a change process. The knowledge gained in an educational setting can prompt someone with new information to think or behave differently than they would have absent an educational experience or intervention. But sometimes, an educational experience does not produce change because an individual blocks or ignores a new fact because she/he is heavily invested in what they think they know based on previous experiences. Self-confidence in what they know causes them to dismiss the new knowledge in favor of what they already believe. The psychological concept of confirmation bias (CB) (Nickerson, 1998) is the label assigned to such behavior as those confronted with an opportunity to extend their knowledge dismiss it because "I already know what I need to know" or because they find the new information in conflict with their beliefs. Thus, CB can be an inhibitor to gaining new knowledge.

This paper will focus on CB as an inhibitor of learning and curiosity and propose an educational approach that puts a premium on having people become aware of their tendency to engage in CB and how it prevents them from expanding their knowledge base. This paper will argue that engendering self-curiosity about our tendency to engage in CB is a first step to becoming more open to information or knowledge that contradicts what we already believe. The review and synthesis presented here will show how an assignment in an information literacy course designed to help students become aware of our CB tendencies through an out-of-classroom experience has application to any course dealing with socially controversial topics. The assignment helps learners begin to critique themselves when they engage in it (Wittebols, 2020). The nature of the process is such that it can be a useful assignment for any course which values developing critical thinking skills. By weaving together developments in theory and research about CB and curiosity, we will explicate the underlying reasons behind a successful learning method that fosters knowledge about oneself in a manner that makes people more open to altering their views in light of new information deemed trustworthy.

Concerns about information/digital literacy spring from a practical problem faced by many educators today—the use of the internet to do research. The course *Information Searching and Analysis* was prompted by a realization that students generally use the internet as an oracle rather than a tool. The ease and speed of searching for information online can make us lazy about analyzing the value of the information found through using search engines. Leslie (2014) argues Internet searches thwart "productive frustration" (p. 55) because search results are obtained almost instantaneously. Like Lowenstein (1994), who argues curiosity is piqued by a gap in our existing information, Leslie says there is hidden value in difficulty and that we learn better when learning is difficult. Thus, problematizing Internet search is a way to get students to learn not to take search results for granted.

Given early in the semester, an assignment which helps students discover their CB tendencies proved to be an integral component in helping students become more critical of search engine results and "news" posted at social media sites. Following a mini-lecture and video examples of CB, students were tasked with a weekend assignment to find instances of CB in themselves, in others, in media, and the larger social world. The CB assignment was the first step for students who selected a social justice topic and did analyses of the kind of information they found on the topic. This exercise can be adapted to any course which covers socially controversial topics—courses in the social sciences and history and humanities courses focused on critical thinking, for example.

On a societal level, the phenomenon of CB can be seen as a manifestation of the highly contentious political atmosphere early in the 21st Century. Retreating to "safe" (in the sense of not having your beliefs contested) spaces on the Internet makes it increasingly possible to avoid

information, knowledge, or news that might confront closely held political positions. With the growing use of the Internet to get news and information, this has been characterized as a "filter bubble" (Pariser, 2010) or "echo chamber" (Nguyen, 2018). Engendered by "personalized" approaches to search using sophisticated algorithms, search engines enable and foster CB by predicting what you want to see based on your past internet use.

This paper will proceed to review theory and research about CB since it emerged from research on cognitive dissonance (Festinger, 1957). We will then explore how curiosity about both the self and the larger world helps people to be open to things beyond what people think they already know. We conclude with a discussion about the value of checking our CB tendencies and how it can be applied to many educational contexts.

CB and Its Resolution

CB is the concept that best summarizes the default reaction to experiences of cognitive dissonance. Cognitive dissonance is the term Festinger (1957) coined for when humans encounter two ideas or phenomena at odds with each other. Elliot and Devine (1994) assert the arousal and psychological discomfort that accompany cognitive dissonance require a reduction strategy or attitude change in order to resolve the dissonance. How humans resolve cognitive dissonance became the focus of research after Festinger began to wrestle with the complexities of it. This section will review the evolution of theory and research on CB.

In an extensive review of theory and research on CB, Nickerson (1998) describes CB as a candidate for the "single problematic aspect of human reasoning" (p. 175). As a generic concept, CB describes the idea of unwitting selectivity in the acquisition and use of evidence. That is, people engage in CB subconsciously even when they have no ego investment. Summarizing the decades of research produced to that point, Nickerson concludes people generally are more inclined to require more evidence when they encounter something not consistent with their own beliefs and that information acquired early in a search process carries more weight than information acquired later. Furthermore, beliefs held with stronger certainty generate overconfidence in those beliefs as people feel they are good judges of their knowledge. Nickerson argues CB can be best thought as a tendency to seek evidence that increases confidence in a belief regardless of whether it embodies a truth-seeking approach. CB allows one to have a degree of certainty that exceeds what the evidence justifies (Kuklinski et al., 2000).

Nickerson (1998) concludes people engage in confirmatory behavior but do not necessarily have conscious confirmatory intentions. It seems reasonable to say people are not bound to engage in CB; that it is not so automatic and not consciously so. He encourages research looking at whether CB can be modified by training in asserting that

> Perhaps simply being aware of confirmation bias…might help on both to be a little cautious about making up one's mind quickly on important issues and to be somewhat more open to opinions that differ from one's own thought than one might otherwise be. (Nickerson, 1998, p. 211)

Related to the idea of CB is how human motivations affect the way we process life events. Kunda's (1990) notion of motivated reasoning attempts to describe how biased processing affects our interpretation of information used to construct and evaluate our beliefs. The tendency to use heuristics-mental shortcuts involving rapid assessments of credibility and trustworthiness are

evidence of motivated reasoning. The systematic bias in how we use heuristics reflects tendencies toward stereotyping and ethnocentrism that are related to fear and anger. People encounter two choices when confronting cognitive dissonance: they can strive to arrive at an accurate conclusion, or they can strive to arrive at a particular, direction-oriented conclusion. When people strive to be accurate, they expend more effort on reasoning and process information more deeply using more complex rules. The desire to be accurate is motivated when the costs of making a wrong judgment or conclusion are substantial. Things which may motivate the accuracy motivation are: being required to justify their conclusions, knowing their evaluations will be made public, knowing their judgments may affect others, and questioning stereotypes. Kunda concludes that when people are asked to consider what judgments they would make when a study reaches conclusions they find conflictive with their own beliefs, people are less able to dismiss those findings and are less inclined to employ disconfirming strategies.

Blaug's (2007) work linking these kinds of psychological processes to hierarchical social environments approaches the issue of CB from a more structural or societal perspective. He argues the effects of hierarchy on the way individuals structure their thinking results in a widely held, "common sense" view of the world that largely goes unquestioned. Drawing on a sociology of knowledge perspective, what he calls a "trick" of human consciousness, is our capacity to reduce and select information consistent with our cognitive schema or mental maps. These schemes are shaped by hierarchical and institutional interests through forms of socialization (family, schooling, media) that endow us with the dominant values in society. The effect of a dominant way of thinking, according to Blaug is to produce an "automated confirmation of existing beliefs" (p. 31) that results from using CB to empirically validate our beliefs. When people become safely ensconced in an ideological bubble of news and information, it negates the possibility of a critical assessment of the news and information one consumes.

Countering CB Tendencies

The question that emerges from the discussion of CB is whether it can be remedied and how that might take place. Some advancements in testing how people cope with cognitive dissonance show that under the right conditions people can be less prone to revert to CB.

Some research points to evidence that making people consciously undertake disconfirmation tasks—developing critical questions and considering counter-arguments, for example—are effective at countering CB (Edwards & Smith, 1996; Koslowski et al., 2013). Shieh-Chieh Hsu et al. (2011) found people are uncomfortable considering counter arguments but making them do so prompts more exploration. This indicates when closely held beliefs are challenged, people do not enjoy the experience of requiring them to go beyond what they believe or know. This reflects CB as psychologically or emotionally comforting and helps explain why it is the default response to cognitive dissonance.

Providing people with alerts about the nature of bias and being warned explicitly about bias is also more likely to prompt people to revise their views (Schwind & Buder, 2012; Schwind et al, 2012). A salient factor was whether their pursuit of information was prioritized by an accuracy motivation (getting it right) or a defence motivation (maintaining beliefs). The defence motivation was a source of biased processing while under an accuracy and cooperation motivation, information processing was more open minded, flexible and integrative.

Research projects applying experimental results to real world situations have found similar results. Gottfried et al. (2014) looked at a presidential debate to see how CB operated in a real-

world context. They found when participants watching a political debate saw one candidate's assertions challenged by the other, they then asserted the original claims to be weaker. On the other hand, Nyhan and Reifler's research (2010), which focused on those who were misinformed, found "correcting" material in news reports (assessments of truth in political ads) failed to reduce misperceptions and could even be seen to backfire when participants were tasked with a defence motivation. They suggest external guidance and correcting information do not seem to be effective in reducing CB and "guidance" in various forms does not always work when people express a great deal of confidence in what they know or express distrust in media attempts to assess political ads for their veracity.

If a defensive response to CB is somewhat predictable, does it matter if the cognitive dissonance discomfort is experienced in a social setting or when people are thinking things through as an individual? One final study helps us understand the differences in whether they experience it individually or as part of a social group. Ball-Rokeach et al. (1984) found self-confrontation and introducing self-knowledge is a key in people's willingness to revise their view on a subject. One key difference is between self-presentation and self-concept. Social situations involve self-presentation and thus can be a mask of sorts and involve ego defences. Self-concept is an internally held assessment of oneself. Self-confrontation of one's self-concept yields self-knowledge in a highly personal way. By learning more about their self-concept in a solitary context, participants in the study had a better understanding of their tendencies and could begin to re-imagine their self-concept. Thus, an intervention accompanied by a moment of self, rather than social, confrontation can lead to revising and changing one's views.

We can conclude research attempting to provide ways to counter CB shows some promise in helping people resist the tendency to engage in CB. Making people aware of how CB functions seems a necessary but not sufficient condition to help people counter their tendency to engage in CB. We must admit the tendency to ourselves before we can begin to correct it. Opening one's mind through self- knowledge and helping them access alternative perspectives provides an opportunity for both more critical reflection about the self and seems to enhance curiosity generally as a result of a more critical approach to resolving CB. In the next section, we review theory and research on curiosity in education with a view to understanding how it might be fostered or encouraged through the CB assignment. The CB assignment developed for this course embodies the elements of CB correction discussed above. Students were given a mini-lecture and video examples of CB and had an accuracy motivation to get it right. They carried out this process as individuals and were urged to reflect on their experience of CB and ponder how it applies to other aspects of their lives.

Curiosity and Learning

Psychologists began to explore the nature of human curiosity in the 1950's when curiosity became regarded as a positive element of learning and education (Berlyne, 1978). Berlyne defines curiosity as exploratory behavior aimed at resolving or mitigating uncertainty. More recently, theory and research on curiosity and learning can be found in both education and psychology literatures.

Arguing curiosity is an essential characteristic of humans, Berlyne (1978) worked to develop a theory of curiosity that could inform learning processes. He describes curiosity as the knowledge emotion providing the motivation to learn more. The disequilibrium created when a coherent view of some aspect of the world is disrupted seems the starting point for exploration to

resolve the uncertainty. The need to make sense of the world around us is the underlying cause of epistemic curiosity. Arnone et al. (2011) and Berlyne (1978) assert the need to be competent is at the heart of epistemic curiosity.

Lowenstein (1994) argues curiosity is a form of cognitively induced deprivation that results from a gap in knowledge. Social characteristics such as age, gender, and socio-economic status are not relevant factors in where, how, and to what extent curiosity is manifest. Epistemic curiosity is relatively independent of sensation seeking (which some label as diversive or perceptual curiosity) as it seeks information to solve a problem or answer an intellectual question (Litman & Speilberger, 2003).

Litman and colleagues developed cognitive scales (Litman 2005, 2008; Litman & Spielberger 2003) around the interest/deprivation dimensions of curiosity. The CFI scale (curiosity as feeling of interest) and CFD scale (curiosity as a feeling of deprivation) were developed to differentiate the two. They found the CFD scale corresponded to higher levels of state curiosity and exploratory behavior compared to the CFI scale. They also found ambiguity and variability are crucial to exploratory behavior when individuals are experiencing knowledge deprivation as this initial discomfort or disruption is part of the need to learn and expand one's knowledge (Lauriola et al. 2015; Litman 2010; Litman et al., 2017).

Notably, the experience of a knowledge gap about one's own competence is particularly effective in generating curiosity (Litman, 2008; Litman et al., 2017). The disruption of one's self-concept generates self-curiosity, which Litman and colleagues argue is a strong motivator for people to learn more about themselves. Thus, the CB exercise can be seen to trigger self-curiosity.

With respect to education, Litman (2005) argues presenting gaps in knowledge to students is generally thought to be one way to motivate them to find answers. He links an information gap argument to four characteristics of curiosity:

1. Large gaps in knowledge can spur curiosity.
2. Curiosity is particularly strong when it concerns one's own competence.
3. Epistemic curiosity requires a knowledge base from which to compare new information. Students need to be made aware of manageable gaps in knowledge. Failure to perceive this gap allows one to fill the gap with a previous stereotype; in other words, filling the gap with CB.
4. If students are made aware of stereotypes and predictions made on the basis of them, they may become more curious to know if their predictions are correct.

The link between CB and curiosity can be summarized in this way: CB tends to thwart curiosity, but self-critique of CB can be transformed into epistemic curiosity under the right conditions. It requires recognition of a knowledge gap, self-awareness about our tendency to engage in CB and self-confrontation about both CB and an individual's belief system.

Thus, engendering curiosity for learning is about dampening students' confidence in what they feel they know by making them aware about knowledge gaps and encouraging them to take the more difficult route of engaging new information or perspectives. Curiosity from this perspective can serve to motivate individuals to think more about the material being presented and encourage deeper thinking about the nature of the information (Pluck & Johnson, 2011).

Reio et al. (2006) point out epistemic curiosity and intellectual motivation to learn can be thwarted by excessive dogmatism, obsession with routine, and a general lack of openness to new

perspectives. Arnone et al. (2011) maintain mandated curricula and testing regimes leave little time to try to foster curiosity.

In contrast, Reio (2004) argues the concept of self-directed learning readiness (SDLR) is a powerful predictor of learning performance and along with curiosity can predict degrees of learning performance. Higher levels of SDLR are correlated with the ability to learn independently, tolerate risk and ambiguity, be more self-reflective and self-starting, and be more creative and successful in a variety of learning contexts. As we will see below, this links to the philosophy behind the flipped classroom.

Thus, the relationship between CB and curiosity becomes clearer. Helping people help themselves identify when they are engaging in CB can help stimulate curiosity about the self and problematize what is considered to be knowledge. Whatever discomfort is generated when individuals question their certainty about something seems countered by the reward accrued when individuals learn some tendencies about themselves that point out the kinds of self-deception generated by CB. It is this experience of empowerment which helps individuals critique their tendency to engage in CB. It is now appropriate to review perspectives on engendering students' critical consciousness in media and information literacy experiences with an eye toward carrying these concepts into social science courses generally.

Information and Media Literacy as Critical Education

There are several issues confronting those who teach media and/or information literacy courses. One is how to have the course be an experience for students that endures beyond the course itself and even their university career. Many facets of news and information literacy apply beyond students' academic lives and can aid them as consumers and citizens (Johnston & Webber, 2003; Mezirow, 1990; Martin, 2011). In order to facilitate this, we need to consider the issues of how students learn in these kinds of courses and the role of an instructor in such a course.

The need for critical thinking and consciousness about digital information is obvious when reviewing research on how students process internet search results. Earlier, it was asserted that students' (and the public's more largely) use of search engines treat the experience largely uncritically. Studies of students' assessment of websites generally conclude they engage in cursory analysis and use heuristic methods to assess the value of a website (Metzger et al., 2010; Metzger & Flanagan, 2013). Some of those heuristic methods reflect a short cut and utilitarian orientation, equating popular with good (Metzger et al., 2010), valuing currency (Case, 2003), and reputation and self-confirmation (Metzger & Flanagan 2013) as ways to assess websites. For current concerns, Metzger and Flanagan (2013) cite "expectancy violation" (p. 216) or the tendency to dismiss unexpected information as not credible as something web users do routinely. Obviously, this tendency parallels problems of CB but also reveals knowledge gaps as factors when CB is experienced and thus can be a catalyst in spurring curiosity.

While most research on how people read or critique websites presents websites created just for the research and asks students to analyze them, Hargittai et al. (2010) took a more holistic approach by having research participants navigate the open web. They found participants did not comprehend the differences between Wikipedia and other articles listed in search outcomes. Most research participants also did not consult "About Us" pages in websites and generally trusted branded search engines to deliver the content they need. Many educators see in such results a requirement that students must come to understand how they participate in the illusions internet searching can enable. This kind of literacy cannot be achieved through lecture, much less preached

at students. Horn (2011) says students must confront the complexity of meaning in the contemporary world and come to understand the socio-political construction of the self in order to come to a more critical consciousness. Such complexities involve understanding key economic, social, and political issues about information and the digital communication infrastructure. Issues such as who owns information, who has access to it, and whether the Internet should be a public good or a private, profit-seeking concern must be considered in order to be information literate. Only when one comes to understand their relationship to the digital infrastructure can they really begin to critique it (Shapiro & Hughes 1996).

The process of discovering and critiquing one's tendency to engage in CB suggests the goal in news/information literacy courses should be to foster not just critical thinking but also seek for students to develop critical consciousness. Critical consciousness is critical thinking about the self. This is what helps students understand their tendency to engage in CB and how it affects their thought processes (Gorski, 2009). Critical consciousness involves understanding the self in relation to the social world, helps to generate self-awareness about CB, and enables an ongoing critique of one's thought processes. The assignment on CB has ripple effects in this respect and might mean it is easier to take the lessons learned into other areas of life beyond academic study.

Education theorists label such processes as active learning (McCarthy & Anderson 2000). When students become more actively involved in learning they begin to learn how to apply concepts to real world processes as a result of active engagement. The independent learning students do in this course takes the concept and applies it to idea of self-assessment in understanding their CB tendencies better. Chen (2015) provides data that active learning creates less passive, more engaged and open-minded students. However, it does involve them having to "unlearn" the old teacher as authority model and that often there is no single "right" answer.

The CB assignment in this course was designed to help students learning about themselves with respect to their self-concept. Helping students become more open-minded and self-critical could help them to break down a social world mired in illusion and mystification that puts curiosity to sleep. Lewis (2012) argues a methodological rigor that moves curiosity from novelty and gossip to epistemological understanding is required for these kinds of literacy courses. Learning is not about thinking accurately for Lewis but is an act of "pensiveness" that emerges from curious attention to seemingly anomalous elements of reality. Curiosity challenges us to translate these seeming anomalies into new narratives and understandings.

The particularities of helping students develop a way to critique news and information in their daily lives inevitably leads to defining a different role set for educators. Education theorists (Horn, 2011; Lewis, 2012; Meyer, 2011; Neumann, 2016) concerned with critical consciousness have identified a particular role set for teachers who work to engender critical consciousness in their students. The appropriate role for faculty in this setting is to be a facilitator of knowledge and eschew the traditional figure of authority attributed to teachers.

Paulo Freire (1970) used the term "banking education" to describe most Western forms of education—a model that sees students as depositories of teachers' knowledge. Banking education sees knowledge as fixed and as something to be transmitted to students. The kind of education required to help students become independent learners and able to sort information that ranges from high quality to nonsense is quite different. An important consideration when planning a news or information literacy course is to understand students' critical literacy practices are gained through experience and not just through lecture.

Commenting on the work of Freire, Neumann (2016) says cognitive change and the development of critical consciousness are not achieved through a mechanical or formulaic

approach. Instead, the goal for such a change is to stimulate serious consideration of alternative points of view. The value of engaging students in alternative ways of seeing and interpreting the world flow from an instructor who does not impose a world view but opens students up to understanding and challenging their own world view. Neumann argues this reflects Freire's confidence that people can arrive at new ways of looking at things when given the tools to reflect and learn about the quality of the information being presented rather than passively accepting a particular view of the world.

The way to teach about things beyond the given is to help students question the social relations that define the self and position students in the real world. Freire's (1973) *conscientizacao* is a critical consciousness that more fully comprehends the self in relation to the socio-political world. The taken-for-granted world is no longer when critical consciousness is awakened (Freire 1973). In news and information literacy, problematizing the results of internet searches and the "personalized" form of searches based on algorithms is a type of CB students must be aware of in order to move beyond the top 10 search results and generate the curiosity to look further and more critically.

The flipped classroom approach (Baepler & Driesen, 2014; Kong, 2014) fits these requirements and helps to define a facilitating role for faculty. The flipped classroom is one which largely eschews lecture by using class time for discussion and activities. The process of engendering critical consciousness can be compared to the constructivist theory of education. Learning based on constructivism puts students at the centre, so they can see themselves in relation to the situation they are learning. Learning in this mode is largely experiential, and the building of knowledge is seen as continual process of self-construction (Allen, 2008; Johnston & Webber, 2003).

In the final section, we identify the commonalities between self-critique of CB, epistemic curiosity, and news/information literacy experiences. Taken together they help define an educational approach that facilitates self-critique of the tendency to engage in CB and better analyze information found in media and Internet searching. Suggestions for application of this assignment in social science and related courses designed to encourage critical thinking will illustrate the broad applicability of this assignment.

Discussion and Conclusion

What emerges from this exploration and linking of CB, curiosity, and information and media literacy education is a prototype methodology for critical learning about the media and digital information worlds and the social world more generally. Understanding people face a choice when confronting cognitive dissonance or are experiencing a knowledge gap, the task for students is to learn how to eschew CB and use cognitive dissonance to stimulate their curiosity. The key to getting them to do that is disrupting how they think about themselves and how they think about the tools used to search online.

Learning about CB is a first step to being aware of how it functions in our daily lives. A disruption in what students think they know is key in helping them change the way they do research online. Disrupting the default response to cognitive dissonance is required to spur greater curiosity in learners. The self is disrupted when they learn their ability to judge information is influenced by their tendency to engage CB. The self-curiosity which results from the CB assignment implies a reassessment of oneself as a way of "checking" their CB tendencies. This also generates epistemic curiosity about the social issue they are researching.

This disruption in self-knowledge and in how one views the world can be a spur to changing the way one processes news and information and change or correct one's self-concept as a student, citizen and consumer. These experiences can endure through developing a critical consciousness which positions individuals in their relationship to their media consumption and information searching. Having "extraordinarily re-experienced the ordinary" (Shor, 1980, p. 93), students bring a new lens to how they process news and information. Thus, this kind of course is an empowering experience for students as they now have new tools to make sense of the world around them. Of course, like immunizations, occasional "booster" experiences of CB tendencies would be helpful for students in their post-university lives as citizens and consumers. Future research in this area can work on how well the lessons/experiences of CB endure beyond the semester.

While this initial assignment works nicely and fits with the goals of mediated literacy education, it has broad applications to the social sciences (courses in social problems, inequality, race, gender and ethnic studies to name a few). Having students reflect on their CB tendencies is a way to get them to reflect on their social perspectives. The CB assignment can be seen as preparatory for many courses examining social issues and structures. It begins a process of self-critique and helps them understand their tendencies and biases generally when speaking about social issues. On an interdisciplinary level, a course could be organized around a comprehensive look at the globalized food system (nutrition/health, agriculture, environmental issues, distribution, hunger, etc.) and students could work in groups to place their own food consumption in context.

The larger point is that the process of students having to discover and acknowledge their CB tendencies, while relatively simple, has a powerful effect and sets up the remainder of the course. These kinds of "fish out of water" experiences can be somewhat uncomfortable because "letting go" of what was formerly believed to be true can be difficult. But the self and social knowledge gleaned from these experiences provide a more satisfying sense of self and knowledge. Such a process acknowledges people have to convince themselves to look at the information environment differently as this is what ultimately leads to an experience of empowerment. In other words, the reward gained by learning how to interpret new information overcomes the need to engage in ego defense to preserve what one believes when views are challenged through new discovery.

This type of education dovetails nicely with a "flipped" classroom approach which focuses on students working independently. Teaching about CB in a more traditional classroom environment would lack the opportunity for students to uncover their own tendency to engage in CB—it would be a much more abstract, academic treatment of CB. For faculty, the challenge in teaching in this kind of format mandates they eschew an "expert" role and take on a role more geared toward facilitating students' learning experiences. Moving beyond traditional lecture and test formats, these kinds of courses have a lasting impact on students because they have taught themselves, they have convinced themselves a new way to do research is empowering and helps open them to a world of exploration and discovery.

By focusing on learning about the self as well as the larger world, students come to a critical consciousness about their own position in the world and how to cope with a world seemingly saturated with information. Being able to situate oneself within a system of information which can seem overwhelming helps students sort out quality, trustworthy sources of information from those which are trying to merely convince or persuade to some point of view.

In a 24/7 world of news and information, developing critical skills and consciousness as a way to make sense of the world seems absolutely essential for the survival of democracy and facing the environmental, social, and political challenges which face humanity.

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