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Cognitive Bias Within The Dental Community

A peer-reviewed continuing education course written by Dorothy Garlough, MPA, RDH

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Cognitive bias within the dental community

Abstract

Cognitive bias is a pattern of thinking in humans that, although flawed, is repeated mindlessly, sometimes resulting in irrational behavior and decisions.¹ Dental personnel need to understand how cognitive biases impact both their patients and their team members. Left unchecked, these automatic associations can cause grave mistakes and injuries, and result in real harm. This course is designed to help dental team members recognize their own biases and see the need to introspect and self-regulate to change them.

Educational objectives

At the conclusion of this educational activity, participants will be able to:

- Identify cognitive biases
- Link some of the common biases to behavior in the dental environment
- Understand heuristics
- Describe questions to challenge assumptions
- Apply tactics to reduce unconscious biases



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Cognitive bias—the “subjective reality” people create based on their own beliefs and experiences—is often flawed.² Everyone has cognitive biases as it is part of the human condition. To date, there have been hundreds of cognitive biases identified by researchers,³ and without exception, all people have biases of which they are not conscious. This defective thinking can lead to misjudgments in dental offices, ranging from misdiagnosis of patients’ conditions to prejudice and inequities toward others in the work environment. Research shows unconscious biases are not perceived by the holder and operate outside of conscious awareness. They can impair judgment and produce faulty decision-making. Cognitive biases operate beyond our control and are a powerful predictor of behavior.⁴

Unconscious biases are rooted in the recognition that the human brain evolved to help the species survive.⁵ Without the brain’s ability to subconsciously process thousands of pieces of information in an instant, our ancestors would have ended up as food for stronger and faster species. Science today is heralding humans’ ability to collaborate and cooperate, as well as the evolutionary development of the prefrontal cortex, as answers to why humankind has risen to the top of the food chain.

Heuristics as mental shortcuts

The development of the prefrontal cortex and larger brains in humans has enabled the creation of heuristics (mental shortcuts).⁶ Heuristics are the automated systems, or rules-of-thumb, that help people make decisions quickly and efficiently, handle social interactions, and determine what they remember. These shortcuts free up mental resources, enabling mental bandwidth deployment in a broader range of decisions as well as other physiological duties.⁶

Heuristics are essentially the brain’s way of systematizing repetitive tasks and decisions. They are the rules in place that automated systems follow, and as long as the rules are not broken, positive results are the outcome. However, automated systems don’t handle exceptions to the rules very well. When those exceptions occur, the errors are cognitive biases. Put simply, cognitive biases are errors in ways of thinking.⁶

An example of such a bias in the dental environment could occur when a patient presents at the dental office with a toothache. This patient is known among the staff as a complainer, and through the years she has made many visits to the office for minor ailments. Comments have circulated among staff that she has hypochondriac tendencies. When this patient arrives for an emergency appointment two weeks after a panoramic x-ray is taken, a clinician may unconsciously ignore her symptoms, thinking her pain is not real. The doctor may not bother with a periapical x-ray and simply send her home with a desensitizing toothpaste. Three days later, the patient returns with a full-blown abscess. The assumption that it was yet another “attention-getting” appointment was a biased judgment.

Confirmation bias

Another common bias is the confirmation bias. This cognitive bias enables people to avoid the effort associated with updating beliefs by sticking to existing opinions and ignoring information that contradicts their thinking. Confirmation bias is the tendency to search for, interpret, favor, and recall information in a way that confirms one’s preexisting beliefs or hypotheses.⁷

This can often be seen in the doctor’s diagnosis of a dental condition. A doctor may arrive at a preliminary diagnosis of what a condition is, and by unconsciously tailoring questions to the patient, uncover supporting data for initial diagnosis while ignoring disconfirming evidence.⁸ This faulty thinking can lead to misdiagnosis for the patient without the doctor realizing that he or she is a victim of confirmation bias. This cognitive bias is broadly recognized by both the dental and medical professions and is leading to the adoption of artificial intelligence to help counteract this human way of thinking. By studying patterns and implementing algorithms, artificial intelligence is helping to refine diagnostic techniques.⁹

Biases affect both educators and learners

Unconscious biases, left unchecked, influence the introduction of information, the accuracy of the data presented,

and the receptivity of the one receiving the information. People are often resistant to incorporating new information that causes cognitive disruptions to their reasoning. The result can be the retention of inaccurate information or dissonance, the psychological conflict held from incongruous beliefs and attitudes caused by cognitive biases.¹⁰ This can make learners unable to take in information at all, let alone effectively. This closed state of mind may cause learners to ignore new evidence, preventing them from doing the work of updating their beliefs. In addition, when information is lacking, people’s brains fill in the gaps with what they expect.¹¹ This information is often inaccurate or not relevant, but is held to be true. The state of the perceiver also has a bearing on information. A heightened emotional state can keep the conscious mind distracted, potentially shutting down receptivity, processing, and thinking.

Unconscious cognitive biases can affect attitudes toward patients in negative ways. Perhaps an emergency patient presents with a neglected mouth. Tooth number 15 has an abscess. He is in severe pain, but it is only one of many problems. Caries are rampant, plaque blankets his teeth, he has moderate periodontal disease, and halitosis is evident. He also has body odor. The patient himself is disheveled, not interested in the health of his mouth, and only wants to have his pain addressed. A clinician might make judgments about the patient and wonder what the point is in trying to educate or even help this patient, as the clinician sees him as a loser and a drain on society. But what if the clinician were aware of this unconscious bias and, upon questioning the patient, learns that he had fought in Afghanistan and has suffered PTSD ever since his deployment? It is likely that the caregiver’s attitude would change, resulting in empathetic care for the patient. Being aware of preprogrammed biases can help alert clinicians of unfounded assumptions.

Biases not only affect patients; they also affect workers in the dental office. Cultural or personal paradigms can create biases toward others, sometimes

crossing the line to prejudice. A tiny bit of bias can have big consequences in the dental office. Conscious or unconscious bias may influence whether an applicant who is of an ethnic origin gets a job. Perhaps a résumé is submitted for a position at the dental office. The applicant's name is Latino in origin, and the doctor chooses not to give the aspiring worker an interview. He may unconsciously believe there is a language barrier when, in fact, the applicant speaks fluent English. Perhaps there is a predisposition to not interview Muslims regardless of their qualifications. Or there may be a biased suspicion of a Black staff member when something is missing, when in fact it was only misplaced. Racial bias is one of the hottest topics of our time. Care needs to be top of mind to ensure that open-mindedness and fairness are applied to all people, regardless of their skin color.

This thinking not only feels morally correct, but it also sows the seeds of success in the dental office. A more diverse workplace isn't just an environment that feels right. Years of research has shown that more diverse workplaces are more innovative and thus perform better than those that are not.¹²

The world today is changing quickly, with technology and information being produced at a faster rate than ever. This leads to complex problems that are best approached by a variety of perspectives. A greater number of productive ideas are generated within varied groups of individuals. Diverse teams outperform homogeneous ones, especially when solving complex problems. The melting pot of a diverse team naturally sows creativity and novel solutions to problems that often plague dental teams.

On an individual basis, connecting to a diverse network of people is a critical edge in one's personal life and career success. The information that one has access to is limited when there are fewer types of networks.¹³ Broadening one's networks not only exposes a person to more ideas, but it also enables possibilities generated from nurturing different relationships. This in turn may provide opportunities that would not be there if only associating with like-minded people.

Questions to challenge unconscious bias

- 1. Clarify your thinking.** Ask yourself: Why do I think that?
- 2. Challenge assumptions.** How do I know this is true?
- 3. Look for evidence.** How can I back this up?
- 4. Consider alternatives.** What might other respected people think?
- 5. Examine consequences and alternatives.** What if I am wrong? What are the consequences?
- 6. Question the original question.** Why did I think that?

Gender bias

Although the gap is diminishing, there are still pay equity issues for women in the workplace. Employers may not be aware of an unconscious bias they hold for women, expecting them to do the same work as men, but for less money. In the United States, the average payment of women's earnings is 81 cents to a man's full dollar.¹⁴ The gender pay gap, which looks at the median salary for all men and women regardless of job type or worker seniority, is 19% higher for men in 2020. Although there are variations between states, all states presently have some disparity in gender wages.¹⁴

According to the 2019 US census, women represent 50.8% of the US population and earn more than 56% of undergraduate degrees.¹⁵ The American Dental Association states that only 33.4% of dentists are women, but the number has significantly risen in the past few years and is projected to rise in the future. The historic socialization that puts men in charge and considers them better leaders than women takes time to dismantle. Men have been the dominant power group around the world and have been socialized to be seen as risk-taking, decisive, and competent.

On the other hand, women have been socialized to adopt behaviors that are considerate, nice, and accommodating to men.¹⁶ With such conditioning, women too can have unconscious bias when it comes to promoting other women. If women aren't warm, they are often seen as difficult, but if they are too warm, they are not taken seriously. In more than one

instance, this author has heard retiring male dentists say that their staff does not want them to sell their practice to a female doctor. The women in the office do not want to work for another woman. This unconscious bias perpetuates the disparity between the sexes on many levels and requires conscious awareness to overcome.

Scientific research is also blameworthy of gender bias. For instance, when the funding ran out in 2013 for a study on a drug that could potentially alleviate menstrual pain, the National Institutes of Health was denied further funding. This drug is Viagra. Today, even though the number of women experiencing menstrual pain is much greater than the number of men with erectile dysfunction, funding for research for erectile dysfunction is five times greater than funding for menstrual pain alleviation.¹⁷

There is a gender gap in data collection, and women are suffering the fallout. Decisions, products, public health, and even dialogue are influenced by gender bias, and there are ramifications for women. Although the US has legislated fair representation of men and women in US research since 2014,¹⁸ it still takes time for the findings to be uncovered and requires a concerted effort to reeducate the public.

Four workplace triggers of unconscious bias¹³

Task: We associate certain jobs with a certain type of person. For example, the American culture in the past related farm work with African Americans. Today, that has shifted to a bias that Latinos are field hands. Dental staff may assume patients have limited incomes when promoting optimum dental care, thereby unconsciously shortchanging patients of possible alternatives. Awareness needs to be fostered in the dental community to check and challenge these biased and unconscious assumptions.

Numbers: When looking at a group, such as job applicants, employers are more likely to use biases to analyze people in the outlying demographics. There is a predisposition to choose the dominant local culture when hiring. Decision makers may

unknowingly believe that minority candidates will cause issues with office culture because of dissimilar backgrounds.

Clarity: When information is lacking, our brains fill in the gap with what we're expecting. The human brain does not like uncertainty. Assumptions, right or wrong, are regularly used to help make sense of the world.¹⁹

Perceiver: A heightened emotional state can keep the conscious mind distracted. The result may be that pertinent information is not received, understood, or assimilated. Research shows that long-term production of the stress hormone cortisol can have an effect on a reduction of neurons in the brain and also a reduction in size on the hippocampus, which plays a role in emotion, memory, and the autonomic nervous system.¹⁹

Tactics to reduce cognitive bias within the dental office¹³

Structure for success: Consistently evaluate and innovate organizational processes. Decide what qualifications matter before making people-related decisions. Nurture a cohesive culture within the dental office that recognizes and values each individual team member. Insensitivity to sample size needs to be consciously addressed. Make the workplace more inclusive, collaborative, and cooperative. Seek programs that focus on building cohesive teams.

Measure for results: Get the facts. It is difficult to work toward equity in the workforce without data collection. Does your office have a fair representation of workers reflecting multiple ethnic cultures? Do you post comments on social media that are open-minded to all cultures and genders? Do you consciously disregard ethnic origins when hiring? Data collection on such questions may reveal issues that need to be addressed.

Evaluate subtle messages: Be aware of socialization within the office.²⁰ Who is included and who is excluded? Ostracism of team members leads to disengagement. Increase feelings of belonging by proactively seeking input from those of minority demographics. Be aware of language that may be inflammatory, hurtful, or unkind, and address it immediately. Create a list

of what biases could look like and have managers check themselves against it to ensure the standards are being met. Make this checklist a part of the ongoing conversation for everyone.

Hold everyone accountable and empower others to call out bias:²¹ Calling out bias is the most effective way to diminish and eradicate it. This requires that everyone on the team understand and support the need to be fair to each person. Team members need to feel safe in order to pinpoint others' unconscious errors in thinking. Fear of repercussions will shut down dialogue that is needed to recognize and overcome unconscious bias.

What individuals can do

Individuals can reduce unconscious bias by engaging in critical self-reflection. Hold yourself accountable and push back against your biases before asking others to do the same. Share stories of vulnerability, learning, and growth you have experienced from your associations with others from different demographics. Be the first to be a role model. Say to others, "I am a diversity champion, and I recognize I have biases and am working to identify, acknowledge, and address them." The effects of those small statements will amplify as they are repeated and enacted by others. Be inclusive of others.²²

Ask questions to understand the root causes of biases of your team.²³ What forms of biases are occurring? What is the team covering up? How do these biases affect you, your colleagues, and your business? Make personal connections and spend time learning how your coworkers experience your workplace. Don't assume you know what and where solutions can be most effective.

Help employees understand their roles in making change. Engage stakeholders from a range of backgrounds to help make decisions more inclusive. Hold your team accountable for relying on structure to modify their judgments and behaviors rather than their own willpower. Give others, especially those who are different than you, a chance. Be open to learning from them as much as they can expect to learn from you. Intentionally mentor and sponsor people of other ethnicities. Reach out

to other champions with proven track records of success inside and outside your organization. Find others with shared passion and commitment and engage them as partners.

Conclusion

Everyone has biases that can change and evolve when they are actively confronted. Remain committed to sustained consciousness to recognize and address unconscious bias in the dental environment. Being aware that cognitive biases exist is the first step toward diminishing the fallout that accompanies them if left unchecked. Mindfully create habits to challenge your own thinking, broaden your reasoning, make no judgments of others (patients or team members), work to become inclusive of all people, and hold everyone accountable. By actively keeping our minds open and our dental offices safe for everyone, we can improve everything from diagnosis to a more inclusive work environment.

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QUESTIONS

1. Cognitive biases:

- A. Are conscious ways of thinking
- B. Are only applicable to certain groups of people
- C. Are unconscious ways of thinking
- D. Cause no issues

2. Cognitive biases:

- A. Are inconsequential
- B. Affect our behavior
- C. Are the same for everyone
- D. Are not a problem in the dental office

3. Which statement is true?

- A. Cognitive biases are always recognized by the holder of the biases.
- B. Cognitive biases affect judgment and decision-making.
- C. Researchers have identified 10 biases held by human beings.
- D. Humans cannot overcome their biases.

4. Heuristics:

- A. Are mental shortcuts
- B. Help people process information more efficiently
- C. Allow for automation of actions
- D. All of the above

5. Heuristics:

- A. When they fail, lead to cognitive bias
- B. Are not important for social interaction
- C. Have no bearing on what we remember
- D. Are not helpful to humans

6. A doctor tailoring questions to support his line of reasoning after making a preliminary diagnosis is an example of:

- A. Sunk cost effect
- B. Confirmation bias
- C. Hindsight bias
- D. Fundamental attribution error

7. Unchecked, unconscious biases influence:

- A. The introduction of information
- B. The accuracy of the data presented
- C. Receptivity of the one receiving the information
- D. All of the above

8. Bias:

- A. Affects both educators and learners
- B. Has nothing to do with learning
- C. Makes for agile-thinking learners and educators
- D. When examined, disappears

9. Unconscious bias broadens people's:

- A. Reasoning
- B. Data search
- C. Interpretation of the data
- D. None of the above

10. What is psychological dissonance?

- A. The psychological weighing of two ideas at once
- B. The same thing as an "ah ha" moment
- C. The psychological conflict that results from holding incongruous beliefs and attitudes caused by cognitive biases
- D. A mental health illness

11. Cognitive biases:

- A. Create an open mind
- B. Can cause learners to be unable to take in information at all, let alone effectively
- C. Are fully informed
- D. Cause people to see opinion as just opinion vs. the truth or fact

12. An example of an unconscious bias in the dental office can be seen in which scenario below?

- A. Judgment about a patient based on dress or demeanor
- B. Making treatment plans based on what you think your patient can afford
- C. Making a diagnosis without considering all the data
- D. All of the above

13. Employers can demonstrate unconscious bias in the hiring process by:

- A. Considering algorithms
- B. Excluding some people because of ethnicity
- C. Implementing a structured system in hiring where all candidates are given the same questions
- D. None of the above

14. Unconscious bias can come into play clinically:

- A. In following sterilization procedures
- B. In instrumentation techniques
- C. In judging patients and coworkers
- D. When x-rays are taken

15. What percentage of people has cognitive biases?

- A. 100%
- B. 10%
- C. 60%
- D. 5%

16. People can ignore their biases by:

- A. Clarifying their thinking
- B. Challenging their assumptions
- C. Avoiding self-reflection
- D. Asking questions

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QUESTIONS

17. A diverse workplace:
 - A. Has been shown to be more conducive to success for the business and its employees
 - B. Is not practical
 - C. Always results in disharmony, lack of new ideas, and in-fighting
 - D. Feels morally wrong
18. A diverse workforce leads to:
 - A. A greater number of ideas
 - B. Novel solutions to complex problems
 - C. A broader range of contacts
 - D. All of the above
19. Research shows that women earn how many cents to every dollar that a man earns?
 - A. 81 cents
 - B. 96 cents
 - C. 75 cents
 - D. 50 cents
20. Which statement is false?
 - A. Women can have a bias toward other women in authority.
 - B. Unconscious bias can perpetuate the disparity between the sexes.
 - C. Historic socialization sees women as leaders, being decisive, risk-takers, and competent.
 - D. A woman who is a strong leader can be seen by others as being harsh.
21. Until 2014, research and funding for research:
 - A. Was equal among the sexes
 - B. Favored research on men
 - C. Favored research on women
 - D. Was determined via a lottery
22. When information is missing, humans tend to:
 - A. Make the best decisions
 - B. Make assumptions
 - C. Do the work necessary to educate themselves
 - D. None of the above
23. Biases:
 - A. Are inclusive of everyone
 - B. Promote open-mindedness
 - C. Can make people unwilling to look at disconfirming evidence
 - D. Are always conscious
24. Dental offices can structure for bias reduction by:
 - A. Continual evaluation and innovation for their organizational processes
 - B. Building a cohesive culture within the team
 - C. Making the workplace more inclusive, collaborative, and cooperative
 - D. All of the above
25. Social media data:
 - A. Needs to reflect inclusiveness of all people
 - B. Has no reflection of bias
 - C. Holds no pertinent information
 - D. Does not need to be collected
26. Which behavior below promotes unhealthy socialization of team members?
 - A. Increased feelings of belonging
 - B. Becoming aware of inflammatory language
 - C. Ostracism of team members
 - D. Creating a checklist of what biases look like
27. The most effective way to diminish or eradicate bias is to:
 - A. Ignore it
 - B. Empower others to call it out
 - C. Have management intervene
 - D. Fire biased employees
28. Which of the following questions should teams ask?
 - A. What forms of bias are occurring in our office?
 - B. What might the team be covering up?
 - C. How are biases affecting you, your colleagues, and the business?
 - D. All of the above
29. Which behavior will not support individual self-awareness of bias?
 - A. Speaking openly about vulnerabilities
 - B. Texting gossip about a team member
 - C. Intentionally sponsoring or mentoring other ethnicities
 - D. Championing others who have a proven track record in reducing bias
30. Which activity best supports self-awareness?
 - A. Mindfulness
 - B. Constant activity
 - C. Forming a clique within your workplace
 - D. Sleep

Cognitive bias within the dental community

NAME: _____ TITLE: _____ SPECIALTY: _____

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Educational Objectives

1. Identify cognitive biases
2. Link some of the common biases to behavior in the dental environment
3. Understand heuristics
4. Describe questions to challenge assumptions
5. Apply tactics to reduce unconscious biases

Course Evaluation

1. Were the individual course objectives met?

Objective #1: Yes No	Objective #3: Yes No	Objective #5: Yes No
Objective #2: Yes No	Objective #4: Yes No	

Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 0.

- | | | | | | | |
|--|-----|----|---|---|---|---|
| 2. To what extent were the course objectives accomplished overall? | 5 | 4 | 3 | 2 | 1 | 0 |
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12. If any of the continuing education questions were unclear or ambiguous, please list them.

13. Was there any subject matter you found confusing? Please describe.

14. How long did it take you to complete this course?

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| 11. (A) (B) (C) (D) | 26. (A) (B) (C) (D) |
| 12. (A) (B) (C) (D) | 27. (A) (B) (C) (D) |
| 13. (A) (B) (C) (D) | 28. (A) (B) (C) (D) |
| 14. (A) (B) (C) (D) | 29. (A) (B) (C) (D) |
| 15. (A) (B) (C) (D) | 30. (A) (B) (C) (D) |

AGD code: 770

EXAM INSTRUCTIONS

All questions have only one answer. If mailed or faxed, grading of this examination is done manually. Participants will receive confirmation of passing by receipt of a Verification of Participation form. The form will be mailed within two weeks after receipt of an examination.

COURSE EVALUATION AND FEEDBACK

We encourage participant feedback. Complete the evaluation above and e-mail additional feedback to Aileen Southerland (asoutherland@endeavor2b.com) and Laura Winfield (lwinfield@endeavor2b.com).

COURSE CREDITS AND COST

All participants scoring 70% or higher on the examination will receive a verification form for three (3) continuing education (CE) credits. Participants are urged to contact their state dental boards for CE requirements. The cost for courses ranges from \$20 to \$110.

PROVIDER INFORMATION

Endeavor Business Media is an ADA CERP-recognized provider. ADA CERP is a service of the American Dental Association to assist dental professionals in identifying quality providers of continuing dental education. ADA CERP neither approves nor endorses individual courses or instructors, nor does it imply acceptance of credit hours by boards of dentistry. Concerns about a CE provider may be directed to the provider or to ADA CERP at ada.org/goto/cecp.

Endeavor Business Media is designated as an approved PACE program provider by the Academy of General Dentistry. The formal continuing dental education programs of this program provider are accepted by the AGD for fellowship, mastership, and membership maintenance credit. Approval does not imply acceptance by a state or provincial board of dentistry or AGD endorsement. The current term of approval extends from 11/1/2019 to 10/31/2022. Provider ID# 320452. AGD code: 770.

Dental Board of California: Provider RP5933. Course registration number CA code: 03-5933-21006. Expires 7/31/2022. *This course meets the Dental Board of California's requirements for three (3) units of continuing education.*

Endeavor Business Media is designated as an approved provider by the American Academy of Dental Hygiene Inc. #AADHPNW (January 1 2021 - December 31, 2022). Approval does not imply acceptance by a state or provincial board of dentistry. Licensee should maintain this document in the event of an audit.

RECORD KEEPING

Endeavor Business Media maintains records of your successful completion of any exam for a minimum of six years. Please contact our offices for a copy of your CE credits report. This report, which will list all credits earned to date, will be generated and mailed to you within five business days of receipt.

CANCELLATION AND REFUND POLICY

Participants who are not 100% satisfied can request a refund by contacting Endeavor Business Media in writing.

IMAGE AUTHENTICITY

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