



# Creativity

## Instructor Manual

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The creativity module introduces students to basic concepts of creativity, such as how we determine if something is creative. The accompanying PowerPoint presentation provides material for your class, including activities and discussion questions, which are designed to help keep your students interested and engaged in the material. This instructor's manual includes discussion questions and activities to help engage your students in the material, and it includes links to other resources that may help you design a great portion of your course.

## Learning Objectives

### Content Specific Learning Objectives:

- Comprehend the three criteria that have to be satisfied to conclude that an idea is creative.
- Appreciate some of the cognitive processes that provide the basis for creativity.
- Know some of the personal characteristics of highly creative people.
- Understand how certain social environments influence creativity.

### Relevant APA Learning Objectives (Version 2.0)

- Describe key concepts, principles, and overarching themes in psychology (1.1)
- Develop a working knowledge of psychology's content domains (1.2)
- Describe applications of psychology (1.3)
- Engage in innovative and integrative thinking and problem solving (2.3)

## Abstract

An idea or solution is considered creative if it is original, useful, and surprising. However, depending on who actually judges these three criteria, we must distinguish personal “little-c creativity” from consensual “Big-C Creativity.” In any case, psychologists who investigate creativity most often adopt one of three perspectives. First, they can ask how creators think, and thus focus on the cognitive processes behind creativity. Second, they can ask who is creative, and hence investigate the personal characteristics of highly creative people. Third, they can ask about the social context, and, thereby, examine the environments that influence creativity. Although psychologists have made major advances in the study of creativity, many exciting and important questions remain to be answered.

## Class Design Recommendations

This material could be covered in one 75-minute class period. If you are teaching in 50-minute class periods, you will either need to reduce the number of activities and discussion questions or split the information into two class periods. Please refer to the Noba PowerPoint and the Lecture Framework below for specific details.

Overview:

- *Warm-Up Activity: Unusual Uses Activity*
- Elements of Creativity
  - Three Criteria
    - Originality
    - Surprise
    - Usefulness
    - Discussion Question
  - Types of Creativity
    - little-c creativity

- Big-C Creativity
- Cognitive Processes: How Do Creators Think?
  - Remote Associates Test (RAT)
    - Activity: Remote Associate Test Examples
  - Unusual Uses Task
    - Discussion Question
- Personal Characteristics: Who is Creative?
  - Activity: Creative Personality Scale
  - The “Creative Personality”
  - Creativity and Mental Illness
    - Correlation
    - Domain Expertise and Big-C Creativity
- Social Contexts: What Environments Affect Creativity?
  - Exposure to Novel Stimuli
  - Multicultural Experiences
  - Sociocultural Systems
    - Discussion Question
- CAT: One-minute Paper

## Module Outline

- Introduction
  - This paragraph introduces the concept of creativity by listing some examples of creativity, such as the iPhone, penicillin, the Eiffel Tower, *Wii Sports*, and a recipe for chocolate fudge.
- Creativity: What is it?
  - This section outlines some elements of creativity, including three criteria for creativity and two types of creativity.
    - The three criteria for creativity outlined in the module are used by the U.S. Patent Office. The three criteria are:
      - Originality
        - How unusual is the idea?
      - Usefulness
        - How valuable is the idea or object? Does it work?
      - Surprise
        - Is it surprising? At the very least, is it nonobvious?
    - Evaluating the three criteria
      - These are quantitative (not qualitative) attributes. They all have a zero point (not at all original, useful, or surprising). If an idea or objects gets a zero on any of the criteria, then it is not creative. Reinventing the wheel might be useful, but, since it has no originality, it is not creative. Inventing a concrete parachute would be surprising, but it would not be creative, as it would have no usefulness.
  - The module outlines two types of creativity.
    - Little-c creativity
      - Who decides whether something is creative? If the person who is creating the

product/art/invention decides, this is “little-c creativity.” It’s subjective and personal.

- Big-C Creativity
  - If someone other than the person who produces the product/art/invention decides whether it is creative, then it’s “Big-C Creativity.” This is an objective or consensual rating of creativity.
- Cognitive Processes: How Do Creators Think?
  - In discussing how creators think, the module outlines two ways to measure creativity.
    - Remote Associates Test (RAT)
      - One way to measure creativity is the Remote Associates Test. This test gives three words and asks for a fourth word that is related to the three words. For example, the answer for “widow, bite, monkey” is “spider.” The associations range from easy to hard.
    - Unusual Uses Task
      - If you take this measure of creativity, you are asked to list as many possible unusual uses (other than the normal use) of an item, such as a brick. The uses are scored on 4 dimensions: fluency, originality, flexibility, and elaboration.
      - This is an example of **divergent thinking**, coming up with many possible answers to a problem. The module also, as a contrast, explains **convergent thinking**, converging on a single best answer.
- Personal Characteristics: Who is Creative?
  - The “Creative Personality”
    - There are some tests of creativity that measure personality and interests. One example is the Creative Personality Scale of the Gough Adjective Checklist (seen in

Table 1 of the module and in the Nova PowerPoint Slides). It lists adjectives, some related to creativity (original, reflective) and some not related to creativity (cautious, narrow interests).

- Creativity correlates with some personality measures, such as **openness-to-experience**, leading some to believe that creativity is partially a personal attribute. **Latent inhibition** is the ability to not focus on extraneous details. However, creative people aren't as good at latent inhibition, which may allow them to make connections and observations other people overlook.
- Creativity and Mental Illness
  - Is there a relationship between creativity and mental illness? Latent inhibition is also associated with mental illness, and there has been research finding a link between creativity and psychopathology. Creative people "are seldom outright mentally ill." In order to test and develop ideas for usefulness, creative people may also need to be intelligent. For Big-C Creativity, individuals will also have to obtain some knowledge and expertise in the domain. Two examples are Albert Einstein and Leonardo da Vinci.
- Social Contexts: What Environments Affect Creativity?
  - Exposure to Novel Stimuli
    - The module discusses Ritter et al. (2012), an experiment where participants were in a virtual reality environment. Participants who were in the condition where the laws of gravity, for example, were violated had an increase in their cognitive flexibility, a component of creativity. This is likely a short-term effect on creativity.
  - Multicultural Experiences
    - An example of a multicultural experience would be living in another country for an extended period of time. This will likely affect creativity if the person is also high on openness-to-experience.
  - Sociocultural Systems
    - The sociocultural system, political, social, cultural, and economic factors, can be more or less encouraging of creativity. For example, think about the 'Dark Ages' (early medieval Europe) versus the 'Golden Age' (Renaissance Italy).

- Conclusion
  - Creativity separates humans from other animals. Psychologists have learned a lot about creativity (and even done so with scientific creativity), but there is still much to learn about creativity.

## Difficult Terms

Big-C Creativity

Latent Inhibition

Little-c creativity

Originality

Remote associations

Unusual uses

## Lecture Frameworks

*Warm-up Activity:* Unusual Uses Test

- One way to test creativity involves coming up with as many unusual uses for a common object as possible (Guilford, 1967; Torrance, 1974). This activity has students do this with a shoe, but other common items include a brick (discussed in the module), barrel, car tire, pencil, and hanger. If you choose a shoe as your demonstration object it may be helpful to debrief with students about which of the novel uses they volunteered seem more or less creative. Ask them why they hold this opinion? This can be a terrific lead-in to the 3 criteria for creativity (below). In addition, novel uses can be categorized according to theme. For instance, shoes can be used:
  - As containers (for food storage, or as a bed for a small kitten)
  - As hammers or clubs
  - As mittens
  - The laces can be used for any tying purpose

- As a weight (especially when filled)
- As art

#### Direct Instruction of the Three Criteria for Creativity

- The module outlines three criteria for creativity, including **originality, surprise, and usefulness**. When discussing these items, it would be helpful to refer back to students' responses to the unusual uses test, as applicable. For example, was there an answer that surprised a lot of students? Was there an original and surprising use that wasn't very useful?
- **Discussion Question:** What about art and poetry? Do they meet the criteria of usefulness?

#### Direct Instruction of Types of Creativity

- Who decides whether something is creative? If the person who is creating the product/art/invention decides, this is "**little-c creativity**." It's subjective and personal.
- If someone other than the person who produces the product/art/invention decides whether it is creative, then it's "**Big-C Creativity**." This is an objective or consensual rating of creativity.

#### Direct Instruction of Cognitive Process: How Do Creators Think?

- **The Remote Associates Test (RAT)**, developed by Mednick (1962), is one way to measure creativity.
  - *Activity:* Remote Associates Test. This activity is based on the Remote Associates Test. For the activity, students are presented with 3 words, and their task is to come up with a 4th word that is related to the first 3 words. The examples are rated very easy, easy, medium, hard, and very hard. For more examples from the RAT, go to <http://www.remote-associates-test.com/>.
- **The Unusual Uses Test** is another test of creativity. At this point, you should refer back to the warm-up activity if you completed it, in order to explain and give examples of the test. This is a great example of divergent thinking, while the RAT is an example of convergent



thinking.

- If you did not do the Unusual Uses Test Activity as a warm-up activity, you could do so now.

#### Direct Instruction of Personal Characteristics: Who is Creative?

- *Activity:* Sometimes, creativity is measured by measuring the associated personality characteristics. This activity is the Creative Personality Scale of the Gough (1979) Adjective Check List. This is also Table 1 in the module.
- If you have been emphasizing nature/nurture in your class, then bringing up the nature/nurture topic is appropriate now. Exploring the personal characteristics of creativity can be seen as exploring the nature elements of creativity. **Openness-to-experience** is correlated with creativity. Also, reduced **latent inhibition** is associated with creativity.
- Is creativity associated with **mental illness**? Discuss some of the issues involved, including the fact that this is correlational research, these are broad concepts, and people need domain expertise for truly creative (Big-C Creative) innovations.

#### Direct Instruction of Social Contexts

- **Exposure to novel stimuli**, including virtual reality experiments where participants see a world that violates the laws of gravity, has been shown to increase levels of creativity.
- **Multicultural experiences** may increase creativity. An example of a multicultural experience would be living in another country for an extended period of time. If you have time, you can ask students about their multicultural experiences and whether they think it has influenced their creativity. This type of experience will likely affect creativity if the person is also high on openness-to-experience.
- The **sociocultural system**, political, social, cultural, and economic factors, can be more or less encouraging of creativity. For example, think about the 'Dark Ages' versus the 'Golden Age.'
- Discussion Question: If you wanted to encourage creativity in our society, what would you do?
  - This discussion question encourages students to apply what they have learned about creativity to this hypothetical situation.

## Class Wrap Up: One-Minute Paper

- The one-minute paper has students answer two questions: 1) What was the most important thing you learned during this class?, and 2) What important question remains unanswered?
- Have students briefly answer these questions in writing and turn them in. After class, assess students' responses. At the beginning of the next class, go over any misunderstandings or relevant questions.
- If you do not conclude with this Classroom Assessment Technique (CAT), it would helpful to use another CAT. For more information on CATs click here: <http://cft.vanderbilt.edu/guides-sub-pages/cats/>

## Activities & Demonstrations

Unusual Uses Test Activity: One test of creativity involves coming up with as many unusual uses for a common object as possible (Guilford, 1967; Torrance, 1974). This activity has students do this with a shoe, but other common items include a brick (discussed in the module), barrel, car tire, pencil, and hanger.

- Time: 10-30 minutes, depending on how many items you provide, how much you discuss students' answers, and whether you add the optional questions (see 'optional' below)
- Instructions for students:
  - Write down all the possible uses for the following object (other than the normal use):
  - Items used in this test (although you can come up with others for your class activity):
    - a shoe (used in the Noba PowerPoint)
    - brick (discussed in the module)
    - a car tire
    - a hanger
    - a barrel
    - a pencil

- After giving students time to write down their answers, ask them:
  - How many uses did you identify?
  - What are some of the uses you identified?
- Optional: If you want to connect it to the three criteria for usefulness, also ask students these questions:
  - Looking at your answers, please evaluate each of your answers on a 0-10 scale with 0 being 'not at all' and 10 being 'extremely' on the following 3 criteria:

Remote Associates Test (RAT) Activity: This activity demonstrates the RAT, one of many tests of creativity.

- Option 1:
  - Time: 30 minutes or more
  - Materials:
    - Students need a computer or smart phone with internet access (if completed as an in-class activity)
  - Have students go to <http://www.remote-associates-test.com/> and take the Remote Associates Test
- Option 2:
  - Time: 10-20 minutes depending on how many prompts and how much discussion you prompt
  - Give students prompts from the Remote Associates Test (see <http://www.remote-associates-test.com/> or the Noba PowerPoint Slides) for options.
  - Ask them for a word that is related to the three word prompts.
  - Each of the three word prompts is rated with a difficulty level of very easy, easy, medium, hard, and very hard.
- Discussion questions:

- Do you think this measures creativity? Why or why not?
- Is this test measuring divergent thinking or convergent thinking? What about the Unusual Uses Test?
- Please note that this test was developed in the 1960s, and the full version may include words that your students may not readily think of, such as 'powderpuff,' 'dust bowl,' and 'cold cream.'

Creative Personality Scale Activity: This activity demonstrates the Creative Personality Scale of the Gough (1979) Adjective Check List. See Table 1 of the module and the Noba PowerPoint slides.

- Time: 10-20 minutes, depending on discussion time
- Have students give score themselves on the adjective checklist. They get 1 point for each of the follow traits:
  - Capable, clever, confident, egotistical, humorous, individualistic, informal, insightful, inventive, original, reflective, resourceful, self-confident, sexy, snobbish, unconventional, wide interests
- Students subtract 1 point for each of the following traits:
  - Artificial, cautious, commonplace, conservative, conventional, dissatisfied, honest, narrow interests, sincere, submissive, suspicious, well-mannered
- Higher scores indicate a more creative personality
- Discussion question: Do you think this is a measure of creativity? Why or why not?

## Additional Activities

Connor-Greene, P. A., Murdoch, J. W., Young, A. & Paul, C. (2005). Poetry: It's not just for English class any more. *Teaching of Psychology*, 32, 215-221. doi:10.1207/s15328023top3204\_2

- This article outlines a poetry assignment in an Abnormal Psychology course, which is one way to inspire creativity from students while also helping them learn the material.

Doolittle, J. H. (1995). Using riddles and interactive computer games to teach problem solving skills. *Teaching of Psychology*, 22, 33-36. doi:10.1207/s15328023top2201\_10

- This article discusses problem-solving, which has a two-step process of production (coming up with ideas) and judgment (evaluating those ideas). There are a few activities mentioned, including word tables and riddles, that can be used in classes to illustrate creative solutions in the production phase of problem-solving.

## Discussion Points

- Do art and poetry meet the creative criteria of usefulness? Why or why not?
  - This question has the potential of prompting a thoughtful discussion about whether art is useful. Some students will likely argue that it is not, while others might argue that it is. Their answers may also be affected by their concept of 'usefulness.'
- Based on what you have learned about the Unusual Uses Test and the Remote Associates Test, what are some issues with trying to create a test of creativity?
  - These two tests measure creativity very differently. Understanding the tests and how creativity can be measured can help students understand the difficulty with 1) measuring creativity, and 2) defining creativity.
- Compare and contrast the Remote Associates Test with the Unusual Uses Test. Do you think they are measuring different aspects of creativity? Also, relate them to divergent and convergent thinking.
  - The Remote Associates Test (RAT) uses convergent thinking, which the Unusual Uses Test uses divergent thinking. Some students may state that they are not measuring the same thing (or the same type of creativity), and it could spark a nice discussion about the definition of creativity and the difficulty of measuring it.
- If you wanted to encourage creativity in our society, what would you do, based on what you have learned in this section of the course?
  - This discussion question encourages students to apply what they have learned about creativity to this hypothetical situation. The module discusses exposure to novel stimuli, multicultural experiences, and sociocultural systems as influencing creativity.

## Articles, Links, and More

### The Creative Spark – TED Talks

- This is a list of 6 TED talks on the topic of creativity. The talks include *Taking Imagination Seriously* (9 min, 26 sec) by Janet Echelman, *Tales of Creativity and Play* (27 min, 58 sec) by Tim Brown, *Where Does Creativity Hide?* (22 min, 52 sec) by Amy Tan, *Do Schools Kill Creativity?* (19 min, 24 sec) by Ken Robinson, *Fashion and Creativity* (14 min, 16 sec) by Isaac Mizrahi, and *4 Lessons in Creativity* (17 min, 20 sec) by Julie Burstein.
- Link: [https://www.ted.com/playlists/11/the\\_creative\\_spark](https://www.ted.com/playlists/11/the_creative_spark)

### The Real Link Between Creativity and Mental Illness

- This blog post in Scientific American addresses the question of whether there is a link between creativity and mental illness. One conclusion is that “mental illness is neither necessary nor sufficient for creativity.”
- Link: <http://blogs.scientificamerican.com/beautiful-minds/the-real-link-between-creativity-and-mental-illness/>

### Remote Associates Test

- This website contains the Remote Associates Test (RAT). Please note that this test was developed in the 1960s, and the full version may include words that your students may not readily think of, such as ‘powderpuff,’ ‘dust bowl,’ and ‘cold cream.’
- Link: <http://www.remote-associates-test.com/>

### Where Do Ideas Come From? – TED Talks

- This is a list of 8 TED talks about generating ideas. The talks include *Where Good Ideas Come From* (17 min, 45 sec) by Steven Johnson, *Your Elusive Creative Genius* (19 min 9 sec) by Elizabeth Gilbert, *How to Start a Movement* (3 min, 9 sec) by Derek Sivers, *How to Get Your Ideas to Spread* (17 min, 1 sec) by Seth Godin, *Where Does Creativity Hide?* (22 min, 52 sec) by Amy Tan, *Embrace the Remix* (9 min, 42 sec) by Kirby Ferguson, and *4 Lessons in Creativity* (17 min, 20 sec) by Julie Burstein.
- [https://www.ted.com/playlists/20/where\\_do\\_ideas\\_come\\_from](https://www.ted.com/playlists/20/where_do_ideas_come_from)

## Outside Resources

**Video: Amy Tan: Where does creativity hide?**

[http://www.ted.com/talks/amy\\_tan\\_on\\_creativity.html](http://www.ted.com/talks/amy_tan_on_creativity.html)

**Video: Creativity science**

<http://www.youtube.com/watch?v=EL4bVMeuxlM&feature=youtu.be>

**Video: How to be creative**

<https://www.youtube.com/watch?v=weIQlthC3Ks>

**Web: American Creativity Association**

<http://www.aca.cloverpad.org/>

**Web: Be More Creative**

<http://www.bemorecreative.com/>

**Web: Creating Minds**

<http://creatingminds.org/>

**Web: Creative Quotations**

<http://www.creativequotations.com/>

**Web: Creativity at Work**

<http://www.creativityatwork.com/>

## Evidence-Based Teaching

Simonton, D. K. (2012). Teaching creativity: Current findings, trends, and controversies in the psychology of creativity. *Teaching of Psychology*, 39, 217-222. doi:10.1177/0098628312450444

- This article, written by the author of the module, reviews some research and trends in creativity. There are sections of the article connecting creativity to cognitive, developmental, and social psychology. Simonton also covers three 'controversies' in the study of creativity: whether creative thought is domain-specific or a general process, the nature/nurture question in the development of creativity, and whether increased amounts of creativity lead to increased psychopathology. The article ends with a brief section teaching creativity,

including musings on whether you need to be creative when teaching about creativity.

## Links to ToPIX Materials

**Grading rubric:** Example of a portfolio rubric that includes 'creativity' as a criteria. Could be used as a prompt for students to think critically about creativity, including whether they want to be evaluated on their creativity.

<http://topix.teachpsych.org/w/page/69958892/Human%20Development%20Portfolio%20Rubric>

**Warm up activity:** Lists of first-day activities, and the 'Anonymous Index Cards' activity could be done as a warm-up activity for creativity

<http://topix.teachpsych.org/w/page/55139707/First%20Day%20Activities>

## Teaching Topics

Teaching The Most Important Course

[https://nobaproject.com/documents/1\\_Teaching\\_The\\_Most\\_Important\\_Course.pdf](https://nobaproject.com/documents/1_Teaching_The_Most_Important_Course.pdf)

Content Coverage

[https://nobaproject.com/documents/2\\_Content\\_Coverage.pdf](https://nobaproject.com/documents/2_Content_Coverage.pdf)

Motivating Students

[https://nobaproject.com/documents/3\\_Motivating\\_Students\\_Tips.pdf](https://nobaproject.com/documents/3_Motivating_Students_Tips.pdf)

Engaging Large Classes

[https://nobaproject.com/documents/4\\_Engaging\\_Large\\_Classes.pdf](https://nobaproject.com/documents/4_Engaging_Large_Classes.pdf)

Assessment Learning

[https://nobaproject.com/documents/5\\_Assessment\\_Learning.pdf](https://nobaproject.com/documents/5_Assessment_Learning.pdf)

Teaching Biological Psychology

[https://nobaproject.com/documents/6\\_Teaching\\_Bio\\_Psych.pdf](https://nobaproject.com/documents/6_Teaching_Bio_Psych.pdf)



## **PowerPoint Presentation**

This module has an associated PowerPoint presentation. Download it at [https://nobaproject.com//images/shared/supplement\\_editions/000/000/222/Creativity.pptx?1475597633](https://nobaproject.com//images/shared/supplement_editions/000/000/222/Creativity.pptx?1475597633).

## About Noba

The Diener Education Fund (DEF) is a non-profit organization founded with the mission of re-inventing higher education to serve the changing needs of students and professors. The initial focus of the DEF is on making information, especially of the type found in textbooks, widely available to people of all backgrounds. This mission is embodied in the Noba project.

Noba is an open and free online platform that provides high-quality, flexibly structured textbooks and educational materials. The goals of Noba are three-fold:

- To reduce financial burden on students by providing access to free educational content
- To provide instructors with a platform to customize educational content to better suit their curriculum
- To present material written by a collection of experts and authorities in the field

The Diener Education Fund is co-founded by Drs. Ed and Carol Diener. Ed is the Joseph Smiley Distinguished Professor of Psychology (Emeritus) at the University of Illinois. Carol Diener is the former director of the Mental Health Worker and the Juvenile Justice Programs at the University of Illinois. Both Ed and Carol are award-winning university teachers.

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