Student Writing Center Resource:
How to Effectively Synthesize

When you were in middle or high school, do you remember being asked to compare/contrast two or more readings? Synthesis is a bit like that. When synthesizing, you identify the links between or among sources in order to make your point. Most graduate-level academic writing includes literature reviews, which relies heavily on synthesis.

Synthesis Strategies

1. Actively Read: as you read your sources, underline and write down your main points or key aspects that serve the purpose of the paper.

2. Think about and compare how different sources treat specific points to help you develop themes/areas of overlap— how will you use them, in what order, and what is the relationship between them?

3. Organize your themes— use a graphic organizer so you can see connections (see pg. 3 of this handout for more on this).

What to Avoid

1. Constructing the body of your paper out of a series of summaries

2. Simply presenting your reader with masses of facts, examples or quotations that are not clearly used

3. Beginning your paragraphs by presenting quotations or facts from your sources. *Instead*, develop clear topic sentences that establish the main idea or theme of a paragraph.

Adapted from https://www.bgsu.edu
& https://www.temple.edu

A Visualization of Synthesis

Pretend you have a writing assignment and are required to use five sources. Each source is represented by a colored circle below.

SOURCE A SOURCE B SOURCE C SOURCE D SOURCE E

Notice how there are no connections between the sources; the five sources are simply listed in some arbitrary order. What if you need to *synthesize* the sources, though? You can start synthesizing by noting the similarities and differences between the sources and mapping them accordingly—a Venn diagram can help with that.

Refer to the Venn diagram on the next page. Perhaps you noticed that A (blue), B (yellow), and C (pink) make similar arguments, so they are grouped together. You also noticed that D (red) and B (yellow) share a similar methodology, so they are linked together. But perhaps D (red) does not make the same argument as B (yellow), A (blue), and C (pink). And E (green) is completely out there on his own! So you can now see that there are several possibilities for synthesizing these sources.

The gray ring around these sources represents the synthesized claims that you can make. For instance, you might claim, "While multiple scholars agree that X, there is no overall consensus on this issue." Or you may claim, "Conflicting methodologies among research creates gaps in the research on X."

https://library.wwu.edu
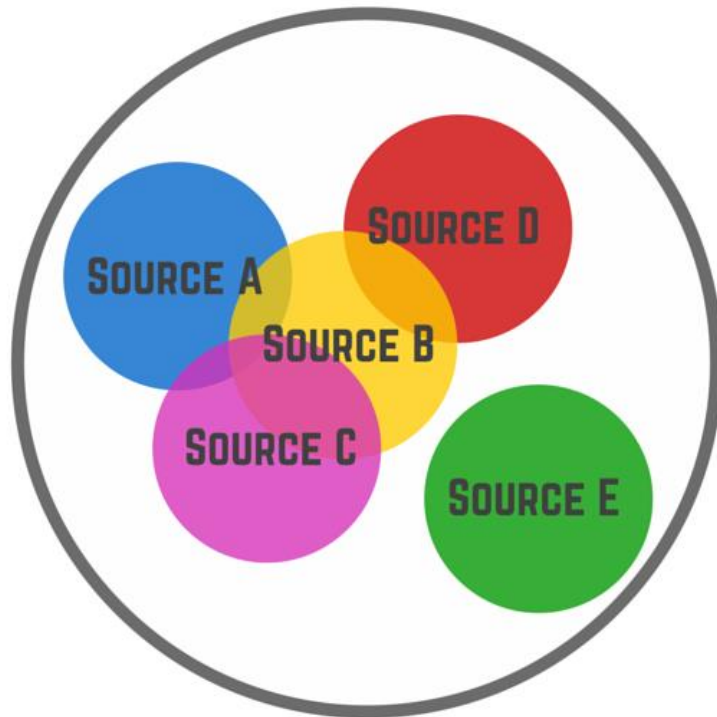
Identifying Common Themes Chart – another way to visualize the themes between or among sources.

	Theme 1:	**Theme 2:**	**Theme 3:**
Source A:			
Source B:			
Source C:			
Source D:			

<p style="text-align:center">Practice</p>

Instructions: Using the information you just read about synthesis, which example effectively synthesizes? Why? *Answers appear on the last page.*

Example A - Classification of Cerebral Palsy

There is no one classification system for cerebral palsy (CP). Miller (2016) notes that treatment for CP uses the Gross Motor Function Classification System, which classifies children based on their age and motor function. There are five levels to this system, from a Level I child with no limitations to a Level V child who must be transported in a manual wheelchair (Miller, 2016). Providers also use the Modified Ashworth Scale to incorporate muscle tone, rather than just function, as part of CP classification, and can also consider evaluating the patient after a treatment intervention (Miller, 2016). Providers can also use the Manual Ability Classification System, according to Miller (2016). Treating CP requires a multidisciplinary approach, and using a classification system helps the entire team work with the same understanding of the child's CP severity (Miller, 2016).

Palisano et al. (1997) developed the Gross Motor Disability Classification System in an attempt to improve on earlier efforts to classify CP in children. The authors found that earlier attempts, such as the Gross Motor Function Measure and Gross Motor Performance Measure, were too general, too dependent on patients' ages, and did not adequately account for the severity of CP (Palisano et al., 1997). Their method instead proposes a five-level classification system focused on "on self-initiated movement, with emphasis on function in sitting and walking" (p. 216) and with levels distinguished by functional limitations, the need for assistive technology, and patients' quality of movement (Palisano et al., 1997). The authors developed the scale and sought evaluation and feedback from other experts in the field because "given the complex and variable nature of the movement disorders in children with cerebral palsy, we believe that consensus among a diverse group of experts is an essential step in the development of a valid classification system" (Palisano et al., 1997, p. 219).

CP is classified by muscle tone and movement, as well as impairments and anatomic findings, according to Vadivelu and González-Fernández (2015). The authors note that CP affects the entire body and therefore a complete history and examination must be completed. Patient

mobility is classified by the Gross Motor Functional Classification System and upper extremity function is classified by the Manual Ability Classification System (Vadivelu & González-Fernández, 2015). Providers must consider the child's age as well, according to Vadivelu and González-Fernández (2015), because age determines the presence of appropriate reflexes, such as the Galant reflex in infants, and typical developmental milestones. Vadivelu and González-Fernández (2015) say, "Assessment should include an evaluation of function, a detailed musculoskeletal examination (to evaluate joint range of motion, deformity, or malalignment), and a thorough neurologic examination (including evaluation of strength, tone, and sensation). Psychological and cognitive assessment may also be performed" (p. 637).

Example B - Classification of Cerebral Palsy

While the International Workshop on Definition and Classification of Cerebral Palsy in 2006 reached an agreement on how to define cerebral palsy (CP), standardizing the classification CP has proven harder (Vadivelu & González-Fernández, 2015). Standardized classification is important to improve communication among physicians and families, ensuring that CP patients' needs are met at each treatment level, as well as to provide consistency across CP databases, research studies and treatment outcomes (Palisano et al., 1997). Treating children with CP requires a multidisciplinary team approach, and standardized classification will ensure the entire team, including physicians, social workers, teachers, and parents, work with the same understanding of the child's CP severity (Miller, 2016).

With a primary impact on the musculoskeletal system, CP classification methods revolve around patients' gross motor capabilities. Several CP experts agree that the Gross Motor Function Classification System, which classifies children based on their age and motor function, is only a starting point for sufficiently classifying CP. Incorporating other factors, such as muscle tone instead of function and evaluating the patient after a treatment intervention, can improve classification efforts and provide a clearer picture of the patient's individual CP (Miller, 2016).

Palisano et al. (1997) developed the Gross Motor Disability Classification System in an attempt to improve on earlier efforts to classify CP in children. The authors found that earlier attempts, such as the Gross Motor Function Measure and Gross Motor Performance Measure,

were too general, too dependent on patients' ages, and did not adequately account for the severity of CP (Palisano et al., 1997). Their method instead proposes a five-level classification system focused on "on self-initiated movement, with emphasis on function in sitting and walking" (p. 216) and with levels distinguished by functional limitations, the need for assistive technology, and patients' quality of movement (Palisano et al., 1997). While Palisano et al. (1997) indicated that age was often over-used to measure the degree of CP, Vadivelu and González-Fernández (2015) caution that age is a vital factor to consider alongside anatomical findings and impairments, especially because early motor function classification systems were designed only for children between 8 and 12 years old. Certain developmental markers, such as the Galant reflex in infants and hand dominance, are age-dependent and could alter CP classification (Vadivelu & González-Fernández, 2015).

Answer Key

Example B is effectively synthesized because it uses multiple sources at a time (hint: there are multiple sources per paragraph) to discuss the ways in which the literature defines Cerebral Palsy.

On the contrary, Example A summarizes the literature by designating only one source per paragraph without making any connections between or among sources.