



FACT SHEET



Sociocultural Systems Thinking Practical Exercises | March 2021

U.S. Army engagements in various parts of the world underscore the importance of understanding sociocultural dynamics. Systems thinking, which is understanding how various factors are interrelated and come together to create the big picture, is an important skill to possess as military leaders work in diverse operational environments. There is a more specific aspect of systems thinking, known as sociocultural systems thinking (SCST), which stresses the significance of the operational environment's culture, its people, and how people function within its culture. Proficiency in sociocultural systems thinking (SCST) is instrumental to constructing effective courses of action.

The U.S. Army Research Institute (ARI) identified the best methods to train adult learners in SCST skills. ARI accomplished this by reviewing published literature on systems thinking, existing activities to enhance systems thinking skills, existing courses designed to teach systems thinking, and real world cases that effectively illustrate the characteristics of SCS. This research undertaking resulted in the following learning objectives:

1. Develop awareness of own biases/assumptions and benefits of SCST. This awareness will include:
 - 1.1. Limitations of linear and reductionist thinking
 - 1.2. Benefits of SCST to understand and intervene in complex operational situations
2. Demonstrate understanding of the foundational theory of SCST. This understanding will include:
 - 2.1. The range and nature of stakeholder groups in SCS
 - 2.2. The structural characteristics of SCS
 - 2.3. The manifestations of SCS structural characteristics
3. Demonstrate the ability to apply SCST skills
 - 3.1. Visually representing SCS interdependencies and the dynamic nature of SCS
 - 3.2. Examining multiple perspectives and historical background
 - 3.3. Translating SCS concepts to envision promising and sustainable interventions
 - 3.4. Interpreting the results of interventions and adapting courses of action

ARI then focused on developing practical exercises (PEs) that can help hone SCST. These practical exercises have to fulfill the following criteria:

- ✓ Address the SCST learning objectives
- ✓ Provide opportunities for learners to practice SCST skills individually and in teams
- ✓ Allow learners to receive feedback
- ✓ Use scaffolding and a *crawl-walk-run* approach
- ✓ Engaging
- ✓ Challenging
- ✓ Relevant to Army operations and compatible with the Army's culture and pedagogical context
- ✓ Afford opportunities for iterative learning
- ✓ Last no more than 2 to 3 hours
- ✓ Require no expensive equipment
- ✓ Require no subject matter experts (SMEs)

The two PEs (Systems Analyses of Real Events - SARE and Scenario Training for Systems Thinking – ST2) that ARI developed for proof of concept in further research, fulfill the above criteria. Both PEs cover the following SCS concepts:

- ❖ Multiple players/perspectives
- ❖ Goal conflict
- ❖ Feedback loops
- ❖ Interdependence and interaction
- ❖ Co-adaptive cycles
- ❖ Second- and third-order effects
- ❖ Historical factors
- ❖ Supporting structures
- ❖ Boundaries
- ❖ Leverage points

Both exercises will expose leaders to various complex issues around the world and the perspectives of involved stakeholders.

[Systems Analyses of Real Events \(SARE\)](#) draws from real world events to highlight systems thinking concepts. The first step in this exercise involves becoming acquainted with the event in question by watching a Vice News video about it. Vice News is a publicly accessible, online media platform that contains short documentaries covering current world topics including political corruption, international drug markets, environmental issues, and more. The complete SARE guide lists specific Vice News videos that facilitators can use. Facilitators are also welcome to use other real

world events presented in other types of media. Cases lend themselves well to SARE if they present issues that:

- Are complex
- Have significant implications
- Expose leaders to different cultures
- Contain diverse stakeholders with disparate agendas
- Possesses ambiguous solution spaces

While watching the video, participants will individually answer a series of questions about it. The general format of the questions is designed to point out significant characteristics of SCS.

- Identifying the relevant stakeholders and their connections to each other
- Considering how the issue changed over time
- Describing the potential second- and third-order effects
- Determining the interrelated problems that are found within the issue
- Formulating interventions to address the issue

After the video, participants will get together into small groups to discuss the questions. The small groups will then reconvene as a class and will discuss the questions as one big group. The specific videos listed in this research product range in length from 15 minutes to 1 hour. It is recommended that the small group discussions and the large group discussion take 1 hour each, but SARE can be tailored depending on the time available for completion.

SARE was evaluated by active military personnel, civilian trainers, and researchers. Ratings were positive. Participants viewed SARE as engaging, effective at demonstrating stakeholder networks and second- and third-order effects, and relevant to Army operations.

Resources that come in the complete SARE guide:

- Facilitator handout
- Read-ahead materials for the participants
- Handouts for seven different Vice News videos
- Supplemental readings in relation to the issues presented in the seven different Vice News videos

Scenario Training for Systems Thinking (ST2) emphasizes systems thinking concepts by drawing from events, both real world and hypothetical. In addition, ST2 can be implemented in a variety of settings, from classrooms to the field.

The facilitator administers ST2 using a deck of portable cards that can be pulled out at any time to pose various problems to the group. Each card is double-sided and contains a *Participant* side and a *Facilitator* side. Each card takes

approximately 30-45 minutes. The *Participant* side has a brief description of a real world or hypothetical event along with challenges, or suggested questions for the group. The *Facilitator* side has tips for guiding the group in discussion along with example responses to the challenges. The group's responses to each challenge can serve as a foundation for larger group discussions on SCS concepts.

In response to user feedback, the cards were redesigned to provide simple facilitator guidance; clarify information based on where previous naïve users struggled; support more effective facilitation with a broad range of facilitators; add more context to the situation presented; list key SCS concepts that are primarily covered in each situation; and have helpful facilitator probes and tips to guide discussion.

Resources that come in the complete ST2 guide:

- Facilitator handouts
- Read-ahead materials for the participants
- Six different ST2 cards

Both SARE and ST2 can be applied to a variety of cases and situations, thus allowing for repeated and deliberate practice. Such practice can provide participants with feedback that they can apply to the next exercise iteration. Furthermore, using multiple cases and situations increases the likelihood that participants will be exposed to a wider range of SCS concepts.

The next step in this body of research is to determine the impact of deliberate practice on higher-order cognitive skills. Future research questions in consideration are:

- When do we start training Soldiers in SCST skills?
- How much time will it take for Soldiers to become proficient in SCST?
- How will performance-based exercises such as these supplement formal classroom training and work experience?
- Can PEs be paired with formal training to accelerate SCST development?

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For additional information - Dr. Ava Santos at ava.j.santos3.civ@mail.mil or (913) 702-5057

STST Card Example – Participant Side

COLONY COLLAPSE CRISIS

Situation: Since 2006, the honeybee population has been declining at rapid rates in North America and Europe. In the U.S., the number of hives has gone from 5 million in 1988 to 2.5 million in 2015. Researchers are concerned that this loss of honeybees could have detrimental effects on the environment, food supply, and the economy – ultimately posing a threat to human survival. Some reports show that one third of the food we eat is tied to honeybees and other pollinators. There are several factors potentially contributing to the decline, including parasites, viruses, fungi, new insecticides, pesticides, and stress from industrialization.

Challenges: 1) Draw all stakeholders and their connections to one another. 2) How do stakeholders’ goals conflict? 3) Describe potential second- and third-order effects, along with unintended consequences, resulting from a declining honeybee population. 4) Note the places where exponential growth may occur in this system. 5) Discuss potential interventions and reasons why they would be more or less sustainable.

Facilitator: If the group is struggling to come up with responses to #3, guide their thoughts by asking questions such as “And what could that have an effect on?” “Would that have an immediate or delayed effect?” “Would that increase/decline in X be steady or rapid, and why?” Encourage them to think about the different crops affected, the role those crops have in the economy, jobs affected by those crops, etc.

SCS concepts covered: Exponential change, goal conflict, interdependence and interaction, multiple stakeholders, second- and third-order effects, supporting structures.

STST Card Example – Facilitator Side

COLONY COLLAPSE CRISIS

1) Farmers rely on the pollination of bees to help their crops, and beekeepers supply farms with bees. U.S. government agencies regulate pesticides, for example, when researchers suggest that there may be an agricultural crisis resulting from the honeybee shortage. U.S. and European food consumers will be indirectly affected by the crisis when it reduces the food supply.

2) Pesticide/insecticide manufacturers are trying to make a profit, but this goal conflicts with beekeepers and farmers, who rely on honeybees to help pollinate several of their crops.

3) Fewer honeybees → crops dying → less food, less food for livestock (less livestock products), decreased farmer productivity. Crops dying have a large economic impact, as the value of plants pollinated by honeybees every year in the U.S. is over \$40 billion. Loss of bees → loss of beekeeper income, increase in demand for honeybee pollination services → increase in the cost of renting bees/pollination services. Fewer honeybees → certain flower species dying, increase in local amateur beekeepers, and increased efforts to ban certain insecticides/pesticides.

4) The negative economic impact on the agricultural market; flower species dying as a result of no bees to pollinate them; continued decline of the honeybee population because there are fewer bees to support reproduction; farmers’ productivity losses.

5) Potential interventions include sharing best practices for bee reproduction among beekeepers and farmers, more research to develop improved bee restoration methods, banning certain pesticides/insecticides, attacking the parasites that are killing bees, encouraging hobbyist/independent beekeepers, U.S. Dept. of Agriculture providing funding to re-seed farms and improve bee habitats, genetically breeding disease-resistant bees.

STST Card Example – Participant Side

FLINT WATER CRISIS

Situation: The auto industry had a critical role in the economy of Flint, Michigan. This industry’s decline in the 80s and 90s led officials to declare a financial emergency in Flint. As a result, the population decreased, businesses and resources decreased, and violent crime and poverty rates increased. To address the financial crisis and cut their budget, state officials switched Flint’s water supply from Lake Huron to the Flint River – despite the tributary’s reputation for being unclean. Corrosion inhibitors were not applied to the water from Flint River, which caused lead from old pipes to leach into the water supply. Long-term lead poisoning can lead to serious health consequences, including lower IQ and behavioral issues in children.

Challenges: 1) Describe the unintended consequences that could have resulted from this decision. 2) Discuss how these effects may change the future of Flint and perpetuate challenges for the city. 3) Imagine that several state officials have now resigned, and you are brought in as a state official to help manage the issue. What actions would you suggest implementing? 4) What would be helpful to know to propose a better intervention?

Facilitator: For Challenge #1 – there are unintended consequences that already occurred, but still encourage the group to brainstorm other consequences of this policy. Also, encourage the group to think about the impact of this decision on other domains – how would a tainted water supply affect citizens’ morale and trust in state authorities? For Challenge #2 – encourage the group to think about the affected population, how some citizens will end up with long-term health issues and financial issues, and how this could affect the city as a whole.

SCS concepts covered: Feedback loops, historical influence, second- and third-order effects.

STST Card Example – Facilitator Side

FLINT WATER CRISIS

1) Intended consequence – cut the budget and address Flint’s financial crisis. Unintended consequences – tainted water supply, leads to negative health effects, decreased citizen morale and trust, affected livestock. These issues could lead to lawsuits, officials resigning from office, riots, increased criminal activity, mental illness, substance abuse, and poverty, which could lead to overwhelmed healthcare institutions and stress on welfare/social resources.

2) Financial crisis → decision to switch water supply → tainted water → lead poisoning → long term physical and mental health effects → decreased IQ, increase in poverty, criminal activity → continued financial crisis

3) Community resilience and engagement are key – stemming from all levels (individual, organizations, businesses, government, and private entities). Extra resources put towards actions showing the community that the government is concerned about their well-being, including replacing lead pipes, greater access to medical care, and holding officials publicly accountable.

4) Percentage of the population that was directly affected, medical (and other community) resources available in the area, funds available to Flint officials to address the issue.