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AUTHOR Kirk, James; Cannon, Becky; Burke, Laura
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ABSTRACT

Learning organizations constantly question and make appropriate changes in their "mental models." Mental models include the images, assumptions, and stories that everyone carries around in his/her mind---personal mindsets of what an individual considers to be "reality." For example, "high work performance" or "service quality" are to an individual worker what he or she considers them to be. Mental models are important to organizations for two reasons: (1) they can often account for why two or more workers can observe the same phenomena and arrive at very different conclusions as to what has occurred; and (2) there can be few fundamental or lasting changes in an organization without first changing the mental mindsets of managers and employees. Several activities can be used to familiarize employees with terms such as mental models, mindsets, paradigms, and paradigm shifts. The game "Leaping to Conclusions" introduces learners to the concepts of "inferencing" and "mindsets," illustrating how previous experiences and personal mindsets influence the way people interpret everyday events. "Made in the USA" focuses on the concept of paradigm shift. "Side Effects" brings participants' attention to the many compromises and adjustments that accompany almost all paradigm shifts. (Instructions for these activities are included in this paper.(Contains 43 references.) (KC)

Mental Models: The Food for Thought

by James Kirk, Becky Cannon, and Laura Burke

Abstract

This article presents an overview of the concept of mental models, three learning activities, and a list of related references. The learning activities are designed to help educators and trainers introduce the topic of mental models to their respective audiences. The game *Leaping to Conclusions* introduces learners to the concepts of inferencing and mindsets. *Made in the USA* focuses on the subject of paradigm shifts, whereas, *Side Effects*, deals the many adjustments and compromises precipitated by such shifts.

Mental Models: the Food for Thought

by James Kirk, Becky Cannon, and Laura Burke

According to Peter Senge, author of *The Fifth Discipline*, learning organizations constantly question and make appropriate changes in their "mental models." But what are mental models and why are they so important? Simply put, mental models include the images, assumptions, and stories that everyone carries around in her/his head (see Figure 1 for some examples). As such, they are personal mindsets of what an individual considers to be "reality." For instance, "high work performance" or "quality service" are to an individual worker what she or he believes "high work performance" or "quality service" to be. Mental models are important to organizations because; (1)they can often account for how two or more workers can observe the same phenomena and arrive at very different conclusions as to what has occurred and (2)there can be few fundamental or lasting changes in an organization without first changing the mental mindsets of managers and employees.

Table 1 Examples of Mental Models

Concept	Old Mindset	New Mindset
Adding device	Adding machine	Calculator
Computer	Data processor	Multimedia machine
Currency	Paper money	Plastic debit cards
Diapers	Cloth	Disposable
Nose wipes	Cloth handkerchief	Paper tissues
Teller	Person	ATM machine
Transportation	Horse and buggy	Airplane
Writing tool	Typewriter	Word processor/computer
Written Correspondence	U.S. mail letter	Electronic mail

To illustrate how a group of employees might observe the same phenomena and arrive at very different conclusions as to what has happened, suppose a company decides to place security guards and cameras at the back entrances to its business. Some employees may see the action as evidence the company doesn't trust them. They might believe the measures are intended to keep employees from stealing company property. Another group of employees may view the placement of guards and cameras quite differently. They may see it as evidence the company cares about its workers. They might see the company's actions and added expense as a means of making the workplace more secure. Similar differences in mindsets might cause workers to view the starting up of self-directed workteams quite differently. Certain workers might see the new workteams as a way of getting more work out of employees. Others may view it as a means of empowering workers.

Before discussing mental models in the workplace, it may be useful to first familiarize employees with such terms as mental models, mindsets, paradigms, and paradigm shifts. Below are three activities designed to help trainers and facilitators introduce these concepts to clients. The game *Leaping to Conclusions* introduces learners to the concepts of "inferencing" and "mindsets." It illustrates how previous experiences and personal mindsets influence the way people interpret everyday events. *Made in the USA* focuses on the concept of paradigm shift (i.e., a change in mindsets). The final activity, *Side Effects*, brings participants' attention to the many compromises and adjustments that accompany almost all paradigm shifts.

Prior to going forward with any major organization change, it is often best to inquire into workers' mental models or mindsets regarding the intended change. Such inquiries are often made during departmental or team meetings in the forms of questioning and reflecting. For example, before attempting to set up self-directed workteams employees might be asked such questions as; "What is a workteam? What does it mean to be a self-directing workteam? Why do they think some companies have gone to self-directing workteams? Why do they think some companies have not gone to self-directing workteams?" While this may be an efficient way of "getting inside the heads" of employees, some employees may feel threatened at such meetings. They may express concern about having their "known beliefs" quarried in such a public fashion. To avoid or minimize such negative reactions, it is extremely important to first create an atmosphere of trust and safety in the work environment. Even when the level of trust is high, company leaders might want to consider using employee surveys anonymously completed by workers and small focus groups to increase their understanding of employees' mindsets.

LEAPING TO CONCLUSIONS

TOPIC

Making inferences from limited information, past experiences, and mindsets

Many employees in an organization operate (i.e., take actions) based on inaccurate and untested beliefs. According to Chris Argyris such misguided beliefs are formulated as individuals climb a mental pathway of increasing abstraction called the "ladder of inference." The process begins with a person making an observation. Specific data is then selected from the observation. Next, the individual adds meaning to the data based on the company's culture and her/his past experiences. Assumptions are made. Conclusions are drawn. Finally, beliefs are adopted and acted upon (see example below).

LEARNING OBJECTIVE

Participants will be able to infer interpretations and assumptions used by a colleague to draw particular conclusions.

NUMBER OF PARTICIPANTS

Any number of players

PLAYING TIME

15-20 minutes

REQUIRED MATERIALS

Pencils, Sample Inference Charts, Practice Inference Charts, and Game Inference Charts.

TO PLAY

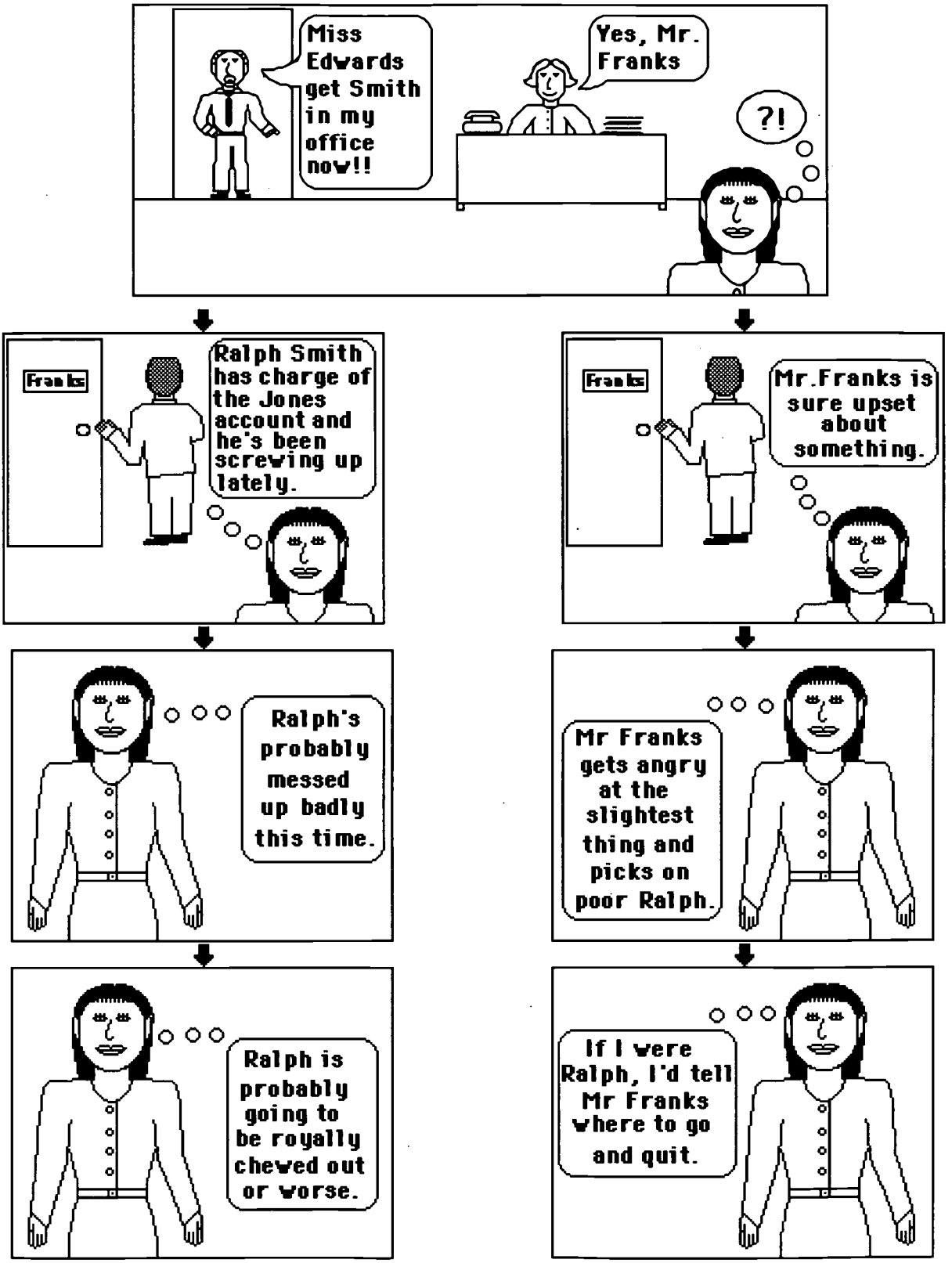
1. Explain how conclusions are sometimes reached through a chain of inferences involving making an observation, interpreting what was observed (i.e., adding meaning based on personal and cultural experience), generalizing from one interpretation of what was observed, and finally drawing conclusions on a set of generalizations.
2. Define mindset (i.e., mental model) and explain how they influence how individuals interpret life events.

3. Pass out a copy of the Sample Inference Chart to each participant. Discuss the examples on the chart. Explain how an observation of the same event can lead to different conclusions.
4. Pass out pencils and copies of the Practice Inference Chart. Ask players to draw in the missing pictures in the "interpretation" and "assumption" cells. Have players share their drawing with a person sitting nearby.
5. Inform players that they are going to be given a Game Inference Chart. As with the Practice, Inference Chart they will fill in missing "interpretation" and "assumption" cells. However, this time the activity will be conducted as a game.
6. Advise players that they will be given five minutes to draw in the missing cells (stick people are allowed). Afterwards they will have five minutes to find other people in the room who made very similar interpretations and assumptions. When they find a person who had similar interpretations and assumptions on the left side of the page they are to have that person initial the two cells. For this a player receives two points. If they can find another person in the room who has similar interpretations and assumptions on the right side of the paper, they are to have that person initial these cells. For these cells they players gets an additional 2 points. Therefore, the most points achievable in the game is four points.
7. Pass out Game Inference Charts to each player.
8. Tell players to begin drawing in the missing cells.
9. After five minutes, have players circulate around the room to get their cells initialed.
10. After five additional minutes, request players to be seated.
11. Ask players with all four cells initialed to stand. Declare these players winners.

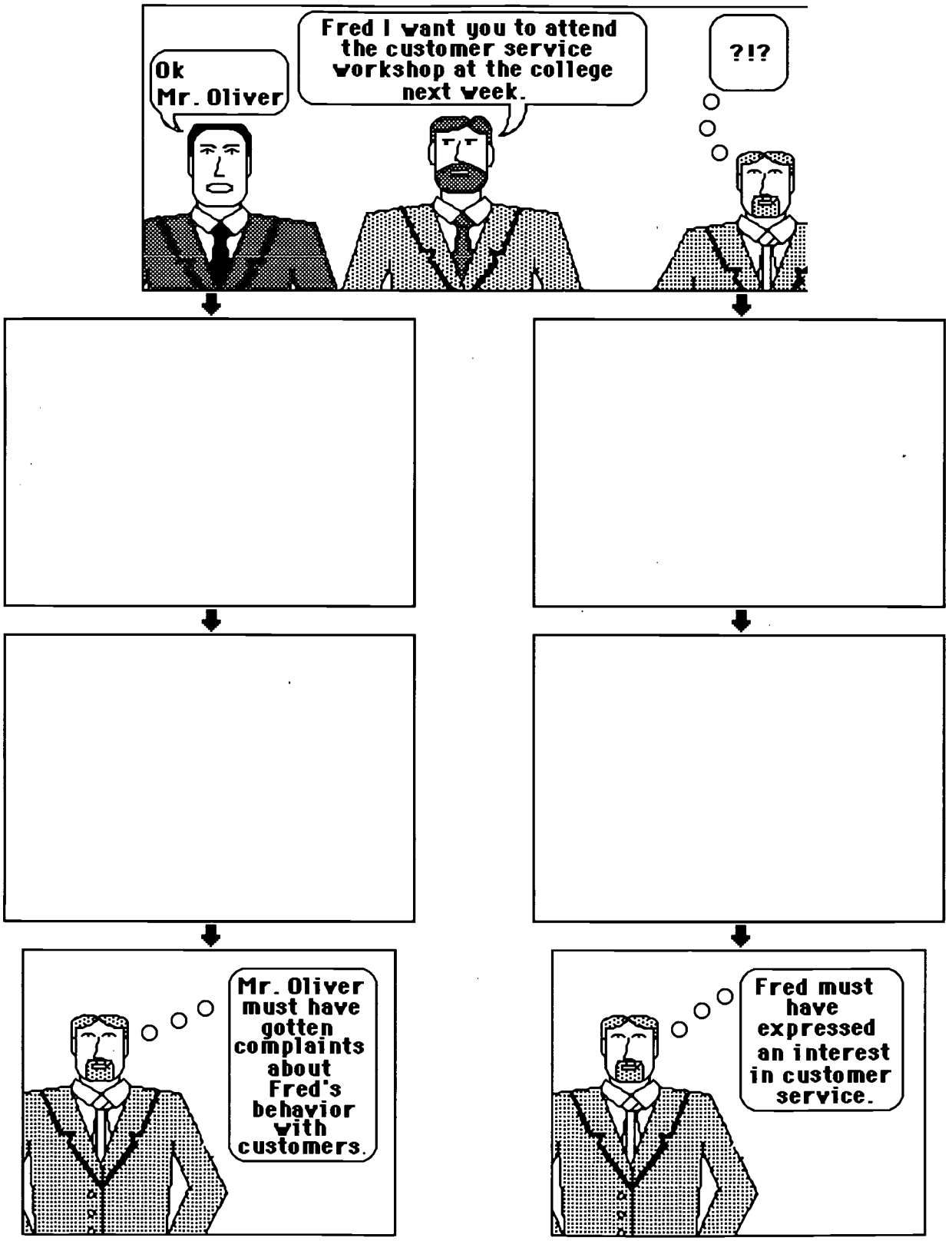
12. Debrief players. Discuss some of the personal experiences that may have lead to some of the interpretations made on the Game Inference Chart. List some of the assumptions drawn by group members and come up with ways these assumptions might be tested (i.e., determined if they are true). Ask players to expound on ways that the making and sharing of inference charts and mindsets could improve employees' thinking skills.

Note: The following illustrations were drawn by Matthew J. Kirk

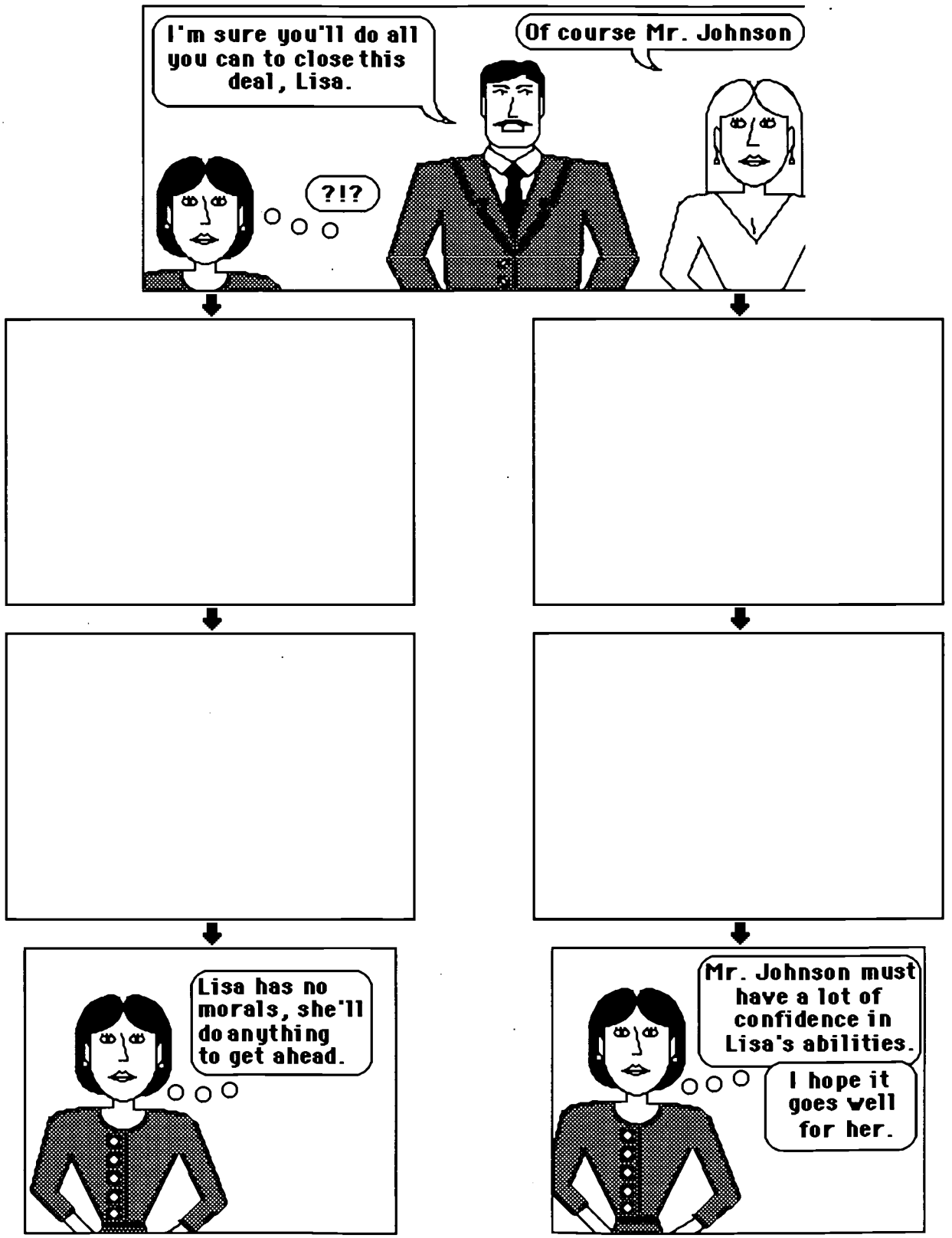
Sample Inference Chart



Practice Inference Chart



Game Inference Chart



Made in the USA

TOPIC	Shift in mindsets
LEARNING OBJECTIVE	By learning where their clothes come from, participants will be able to discern a shift in the U.S. economy (i.e., a shift from a domestic to a global economy)
NUMBER OF PARTICIPANTS	Any number of players
PLAYING TIME	15-20 minutes
REQUIRED MATERIALS	Paper, pencils, flip chart, markers, and participant's clothing labels.

TO PLAY

1. Introduce the concepts of mental models and shifts.
2. Go over the learning objective of the game.
3. Ask participants to divide into pairs.
4. Pass out a sheet of paper and a pencil to each pair.
5. Ask the pairs to look at all the labels in their clothing to see where the items was made.
6. Have each pair make a list of the countries in which their clothing was made. Ask that they place a check mark (√) beside the name of a country each time they encounter an item of clothing manufactured in that nation.
7. As a large group, list on a flip chart the five places (countries) in which most of participants' clothes were made.
8. Debrief players by asking them; (1)What do these numbers tell us about the U.S. economy? (2)Would these numbers have been different 40 years ago? Why? Why not? and (3)How important is it for the leaders of American organizations to have a global versus a domestic view of U.S. economy?

Side Effects

TOPIC	Changes resulting from major shifts
LEARNING OBJECTIVE	Participants will be able to identify adjustments and compromises precipitated by major shifts in mindsets
NUMBER OF PARTICIPANTS	Any number of players
PLAYING TIME	15-20 minutes
REQUIRED MATERIALS	Copies of the case study "A College Student" and flip chart.

TO PLAY

1. Introduce the concepts of mental models and paradigm shifts.
2. Go over the learning objective of the game.
3. Pass out copies of the case study "A College Student" to each participant.
4. Give learners five minutes to read and privately reflect on the case.
5. With help from participants, write on the flip chart the old concept of "college student" held by Mid-Atlantic College.
6. With help from participants, write on the flip chart the new concept of a "college student" held by Mid-Atlantic College.
7. With help from participants, write on the flip chart some the adjustments and compromises that employees of Mid-Atlantic College may have had to make in order to accommodate the new concept of "college student."
8. Ask participants to give additional examples of organizations making major shifts in key paradigms. Discuss some of the adjustments and compromises required of employees to accommodate the shifts.
9. Discuss how companies might help employees prepare to cope with the inevitable fallout that ensues from major paradigm shifts.

Case Study
"A College Student?"

Mid-Atlantic College had come to a cross-roads. They were a small private college in the middle of North Carolina with a student body of approximately fifteen hundred students. They had not been able to increase their student enrollment. It seemed that no matter what they tried, or how much money they poured into the Admissions Department, they struggled each year to maintain their size. The pool of "traditional" seventeen to eighteen-year-olds graduating from high school was shrinking. Many schools in North Carolina were less expensive than Mid-Atlantic. If they were going to continue to exist as an institution, they knew they had to change the type of student they were going to recruit and attempt to retain.

Mid-Atlantic, like most other small colleges, offered many majors via day classes, on a traditional sixteen week semester system. This format was only conducive for a seventeen to eighteen year old students who either lived nearby or on campus. The administration knew that if they were going to attract anyone other than the diminishing traditional student, they had to change what was offered, when it was offered, and how it was offered.

National demographics showed that the largest number of students going to school were twenty-five to forty year old adults. The majority of these adults were full-time employees with families. Therefore, the traditional format of classes was not an option for these students. Adults were returning to school to either enhance or change their careers. Most adults returning to school were desiring a quick method of completing their degrees.

Armed with this research, Mid-Atlantic College chose to begin an accelerated degree completion program with all classes offered in the evenings. Through their research, they discovered that adults did not have the time nor the patience to wait each semester to register for courses. Often students would discover there were not enough people registered, so the class had to be canceled. Adults preferred to have the courses mapped out well in advance and guaranteed. The only way to insure students of this, was to organize the students into cohorts and have them go through a lock-step program.

Mid-Atlantic's program has grown tremendously. They have exceeded all their goals in the first two years by two hundred percent. The students attend class each week, always on the same night of the week, and they attend year round, with breaks only when class meetings fall on holidays. They focus totally on one course at a time for five weeks and then move immediately to the next course. The students like the format and the fact that all the courses are scheduled for them so that it is possible for them to complete their degree (junior and senior year) in approximately twenty-two months.

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Printed Name: James J. Kirk

Organization: Western Carolina University

Position: Associate Professor

Address: 210 Gillian Dale

Tel. No.: 704-227-7310

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