Mili\n
tary decision-making is undergoing a metamorphosis.

In the past, information flowed in from the field and worked its way up interim channels before reaching commanders. Today, leaders communicate more directly with field personnel. Also, technology has escalated the amount and variety of information that’s available. And with sources ranging from real-time sensors and voice communications to archived data, the result can be ambiguous, disjointed information rather than integrated, organized reports.

“This puts far greater pressure on leaders, who must make faster decisions while sifting through more data,” says Dennis Folds, a principal research scientist at the Georgia Tech Research Institute (GTRI). For the Army Research Institute, Folds is studying how decision-makers can render speedier verdicts without succumbing to judgment errors.

**Seven Decision Traps**

When people process information, they develop unconscious strategies — or biases — that simplify their decisions. Previous studies show seven specific biases affect individuals who must wrestle with large amounts of data:

- **Absence of evidence.** Missing, relevant information is not properly considered.
- **Availability.** Recent events or well-known conjectures provide convenient explanations.
- **Oversensitivity to consistency.** People give more weight to multiple reports of information, even if the data came from the same source.
- **Persistence of discredited information.** Information once deemed relevant continues to influence even after it has been discredited.
- **Randomness.** People perceive a causal relationship when two or more events share some similarity, although the events aren’t related.
- **Sample size.** Evidence from small samples is seen as having the same significance as larger samples.
Vividness. When people perceive information directly, it has greater impact than information they receive secondhand — even if the secondhand information has more substance.

What existing decision-making research does not reveal, however, is how these biases affect people when they’re dealing with lots of information – and little time to form conclusions. With that in mind, Folds has been conducting a series of experiments over the past three years that combines a high volume of data with time pressures.

In the experiments, subjects viewed an inbox on a computer screen containing a variety of text messages, maps, photographs, and video and audio recordings. Subjects (the majority being Georgia Tech ROTC students) were instructed to report certain military situations, such as incidents of sniper fire or acts of suspected sabotage. Yet they were not to report other events, such as normal accidents in an urban area unrelated to enemy activity.

To decide whether an event should be reported, subjects reviewed a series of messages that contained both bona fide evidence, as well as information created to trigger the biases that cause poor decisions. In each trial, subjects were allowed enough time to spend an average of 20 seconds per data element plus one additional minute for reporting; they were also asked to attach information that supported their decision.

In the first experiment, all seven biases appeared with the greatest number of errors caused by vividness and oversensitivity to consistency. In addition, Folds discovered two new biases that can hinder the quality of rapid decisions:

- Superficial similarity. Evidence is considered relevant because of some superficial attribute, such as a key word in a message title. For example, a hostage situation might have been reported earlier, and then another message shows up in the inbox with the word “hostage” in its header, although the message’s actual content has nothing to do with hostages.
- Sensationalist appeal. Items containing exaggerated claims or threats influence a decision-maker, even when there is no substance to the content.

Folds was surprised at how well subjects could perform the task while under pressure, he says. Although he expected an accuracy rate of about 50 percent, subjects correctly reported 70 percent of incidents.

Training Payoff

In a second experiment, researchers divided subjects into two groups, using one as a control group while training the other group how to spot conditions that spark decision-making biases. Subjects who received training were able to detect about twice as many “false-alarm opportunities” as the control group.

The biggest difference between the two groups involved “persistence of discredited information” and “small-sample” biases. Forty-eight percent of trained subjects were able to recognize when a “persistence” bias existed compared to 18 percent of the control group. Fifty percent of trained subjects caught the “sample-size” traps versus 11 percent of the control group.

Although training helped participants recognize when traps existed, it didn’t help them identify the specific bias. “When subjects were under pressure to make decisions rapidly, the distinctiveness of the categories fell apart,” Folds explains. “That’s significant, because it helps us tailor training efforts.”

Folds’ team is conducting three more experiments: Two new sets of trials examine how decision-making errors occur in groups, while another experiment is trying to pinpoint how rapidly individuals can make good decisions.

Thanks to software designed especially for the trials, researchers can tell when subjects open a document for the first time and when they go back for a second time or third look. The amount of time that subjects spend reviewing data — along with the data they attach to reports — helps researchers determine what kind of information is meaningful. In the first two experiments, subjects showed a decided preference for text messages over other formats.

“The immediate application for this research is to develop training programs to improve decision-making,” Folds adds. “Yet our findings could also help design new types of decision-support systems.”

Read more at: gtresearchnews.gatech.edu/reshor/rh-w05/decisions.html