Uncertainty is a fundamental experience in human life, and medical decisions are no exception. This will not surprise readers of *Medical Decision Making*. The communication of risk information is a crucial activity in medicine, as risk information informs the judgments and recommendations of physicians as well as the decisions of patients. Risk communication, however, is complicated not only by the need to express uncertainty effectively, efficiently, and accurately, but to receive and perceive these communications to equitably enable consistent, coherent, and useful action.

Two papers in this issue provide compelling demonstrations of these complications. Wegwarth, Gaismaier, and Gigerenzer asked physicians to estimate the effectiveness of cancer screening on the basis of combinations of five-year survival rate, annual disease-specific mortality, and incidence, and found that ineffective screening programs can appear highly effective to physicians when presented as comparisons of five-year survival rates between groups or over time. Peters, Hart, and Fraenkel measured numeracy in an internet sample and asked participants to rate the subjective riskiness of a hypothetical headache treatment under differently framed (as gains, as losses, or combined) descriptions of side effects presented in either frequency or percentage formats. They demonstrated the expected impact of gain/loss framing on perception of risk, that combined framing resulted in intermediate perceptions, and that the percentage format led to lower risk perception among respondents who were low in numeracy.

The studies differ in their participants (physicians vs. general public), their stimuli (statistical outcomes of screening vs. numerical descriptions of therapeutic effects), and their
response tasks (decisions about effectiveness which have correct answers vs. subjective ratings of risk). Yet each of these studies reveals that risk perceptions are substantially influenced by the way “objective” risk data are described and presented. Each represents a relatively early exploration of the phenomenon in medical decision making, and each cries out for further research on the mechanisms of influence. Among the physicians in the first study who attempted to estimate numerical effectiveness of the cancer screening program, few provided estimates whose source could be clearly determined. Among the patients in the second study, the impact of numeracy on framing in medical decisions differed from that found in research on non-medical decisions. We need to discover why.

One potentially fruitful direction for investigation is linguistic. Even the communication of medical statistics is embedded in natural language and employed in linguistic contexts. Grice argued that in a cooperative relationship, communication is characterized by a set of presumptions (“conversational maxims”) that listeners are likely to hold when receiving information. These maxims, which include the presumptions that information will be presented will be true, relevant, and optimally informative, could naturally lead physicians to expect that five-year survival rates are useful in making judgments about the effectiveness of screening over time (or else they wouldn’t be presented by journals), and patients to expect that risk information is framed as losses when it is important to evoke concern. Cognitive linguistic analyses suggest that mathematics is based in bodily experiences extended via conceptual metaphor, which may help shed light on how people understand frequency or percentage information. Linguists and their methods could be fruitfully recruited to aid decision psychologists in future research.

These studies challenge the conventional analogy of risk information as an object that is handed over intact from doctor to patient. Journals publish risk data that is interpreted by physicians, physicians share their perceptions of the data with patients, and patients construct their own perceptions of the risks and benefits of screening or treatment. Along the way, the
data are transformed in accordance with the need, context, and understanding of the participants. As the authors of these papers suggest, improving risk communication – moving from deceiving to informing – requires taking both risk perception and statistical understanding seriously.

References