

possible justification for using a screening test in spite of these problems. The recent, highly publicized Walker spy case is but one example of several recent disasters in our national security system. The consequences of failing to detect leaks of secret information to foreign governments may be severe. A polygraph test that correctly identifies 88% of deceptive individuals tested, misclassifies only 3% and yields 9% inconclusive outcomes could be relied upon to identify most security risks. However, since the base rate of deception in this population is so low, most of the individuals who would fail the test would in fact be truthful. If a deceptive polygraph outcome is more often wrong than it is correct, it is clear that it should not be the sole basis for concluding that a person is a spy, for denying individuals access to secure information or for taking other action against them.

On the other hand, if the screening test is used only to eliminate from further consideration all those who pass the test, then the number of potential security risks would be reduced by a factor of approximately 10 (Raskin and Kircher, 1987). Extensive field investigations would then be required on a much smaller number of individuals with a somewhat higher base rate of deception than in the original sample. With this "successive hurdles" approach (Meehl and Rosen,

1955), polygraph screening tests could be used in the vast majority of cases in lieu of costly field investigations. The required follow-up investigations of those who fail the initial screening test would minimize the risk of false positive errors and probably identify the individuals who are guilty of compromising our national security.

ADDITIONAL REFERENCES

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Comment

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Professor Gastwirth's most interesting paper, coupled with my craving for poppy seed bagels and my passion for our Fourth Amendment right to privacy, has led me to a new appreciation of the importance of specificity θ in medical screening. My work with Dr. Goldberg (Goldberg and Wittes, 1978, 1981) has focused on the sensitivity η ; the inverse symmetry of Dr. Gastwirth's equations (3.1) and (3.3) point to diametrically opposed criteria for optimality depending on whether one is interested primarily in the predicted value positive (PVP) or the predicted value negative (PVN). In the former case, Gastwirth shows that θ should be estimated most precisely; in the latter, the emphasis should be placed on η .

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The context of the screening determines whether the sensitivity or the specificity is more important. For the cases that Dr. Goldberg and I have considered in the past, screening was performed for the benefit of the screenee. A woman elects to participate in a breast cancer screening, for example, because she is seeking an early diagnosis of a disease for which early diagnosis can translate to her own lengthened survival (Shapiro, Strax, Venet and Venet, 1973). Hence, from her, the consumer's point of view, a screening program consisting of a highly sensitive test, followed by a highly specific test if she is positive, is a sensible course of action. Consideration of the PVP is then secondary to the needs of the consumer. When, however, the consumer is not the screenee, but the society at large, and when that society assumes an implicitly adversarial position with respect to the screenee, Gastwirth's emphasis on the primacy of the specificity