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FACTORS THEORETICALLY AFFECTING THE INCIDENCE OF DECEPTIVE RESPONSES DURING PREEMPLOYMENT SCREENING PROCEDURES

By

Howard W. Timm

and

W. Keith Hedges

Abstract

The purpose of this paper is to examine the factors theoretically affecting the incidence of deceptive responses made during preemployment integrity screening procedures. A cognitive model depicting the factors that are identified is presented. In addition to providing certain conceptual and intuitive arguments germane to that model, an empirical test of one of its segments was conducted. The results support the premise that a candidate's perceived likelihood that a deceptive statement would be detected as false is an important factor for many candidates who are considering whether or not to admit that they had committed serious forms of misconduct. The paper also serves to document the utility of both the Inwald Personality Inventory and preemployment polygraph testing in inducing candidates to make admissions about their previous forms of misconduct.

This article is based on a paper presented at the Annual Meeting of the Midwestern Criminal Justice Association, October 1988 in Chicago. The views expressed in this article are those of the authors and do not reflect the official policy or position of the Department of Defense or the U.S. Government. Dr. Timm is with the Defense Personnel Security Research & Education Center in Monterey, California and W. Keith Hedges is with Coast-to-Coast in Morgan Hill, California. Requests for reprints should be sent to Howard W. Timm, Ph.D., PERSEREC, 99 Pacific Street, Bldg. 455-E, Monterey, CA 93940.
Factors Affecting the Incidence of Deception

According to Knapp and Comadena (1979) lies can be defined as "the conscious alteration of information a person believes to be true in order to significantly change another's perceptions from what the deceiver thought they would be without that alteration." Overt lies can be distinguished from half-truths in that intentional half-truths are attempts to withhold certain bits of information from the statements one makes in order to try to significantly change another's perception from what that person may have believed had the entire truth been told. Table 1 (modified from Mitchell and Thompson, 1986, p. 325) further illustrates the nature of these relationships.

**TABLE 1**

**CATEGORIES OF COMMUNICATION**

<table>
<thead>
<tr>
<th>Reveal</th>
<th>Conceal</th>
</tr>
</thead>
<tbody>
<tr>
<td>FACT</td>
<td>Disclosure</td>
</tr>
<tr>
<td>LIE</td>
<td>Overt Lie</td>
</tr>
</tbody>
</table>

Sometimes when people respond to questions they unintentionally provide inaccurate responses. In certain cases this results from self-deception (Paulhus, 1986; Zerbe & Paulhus, 1987). For example, if a lazy employee was asked "Are you a hard worker?" that employee might respond "yes" and actually believe the response given was accurate. Non-pathological self-deception appears the most likely to occur when the issue raised is subject to either broad interpretation or weak or faulty memories. Consequently, when dealing with normal adult subjects, one would not expect self-deceptive responses to the following types of questions: Did you receive an honorable discharge from the Army?; Have you ever used cocaine?; and Have you ever been convicted of a felony? Table 2 depicts the conditions under which self-deception occurs.

The purpose of this paper is to examine the factors theoretically affecting both the incidence and nature of intentional deceptive responses that are made during preemployment integrity screening procedures. Given the consequences of admitting prior acts of serious misconduct, it seems reasonable that a large percentage of the applicants who have notable "skeletons" in their past will be less than perfectly candid about those areas during their preemployment interviews. A study conducted by Turner, Edgley, and Olmstead (1975) appears to indirectly address this issue. Those researchers asked 130 people to record and analyze their own statements in an important conversation in terms of honesty. The subjects labeled only 38.5% of the statements that they had made during those conversations as being "completely honest."
TABLE 2

CATEGORIES OF RESPONSE

Subject Believes Statement Given Is Accurate?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statement

Yes  Truth  False-Lie
Historically

No  Self-deceptive  Lie
Accurate?

It appears that it is normally easy to accurately predict which direction most people will consider attempting to "color" their statements. For example, while many people are willing to tell half-truths and lie during certain situations in order to receive more favorable outcomes (or to avoid certain negative outcomes), most people appear very resistant to making false admissions, especially when they feel that those admissions would be against their best interest. There are, however, certain situations in which even false admissions may occur, such as when people are attempting to:

1) obtain the perceived best possible outcome given the situation with which they are faced (e.g., a "three time loser" who was committing another offense at the time may falsely admit guilt in order to engage in plea bargaining and/or have an alibi for the actual and more serious offense)

2) protect others from harm whom they revere (e.g., a parent or spouse falsely admitting guilt to protect a loved one)
Factors Affecting the Incidence of Deception

3) achieve certain desired consequences (e.g., fame, acceptance by peers, attention, publicity for a cause, food and shelter during confinement, higher status among peers, a "return ticket" to an institutional environment in which they have grown acclimated)

4) accept blame for the misdeeds of another in order to acquire some form of compensation for "taking the rap"

5) accept responsibility for the alleged actions, if they are convinced that they are guilty even though they are, in reality, innocent.

It is assumed that most of the exceptions noted above will occur very infrequently and when they do, almost exclusively during confessions that are made to authority figures who are conducting investigations of alleged infractions. The third exception noted, however, is also likely to be directed to those with whom the deceiver is attempting to gain favor (e.g., peers who are perceived as being more accepting of, or impressed by, those who violate certain standards of conduct).

Given that most people who apply for positions actually want to be offered the job they are seeking, it is unlikely that many applicants would ever falsely admit to past derogatory conduct during preemployment interviews. Consequently, it appears that the only individuals who would consider making false admissions in those instances either: 1) do not actually want the position and are going to the interview simply to satisfy certain demands that they actively seek employment, 2) are mistaken about their guilt, or 3) for some reason believe that falsely admitting past forms of misconduct would enhance their chances of being offered the position. Perhaps the two areas in which this issue of false admissions most frequently arise during preemployment situations are when applicants allege that earlier admissions they made were inaccurate and when third party accusations are made during background investigations that were based solely upon the subjects' earlier self-admissions to those individuals. When those allegations cannot be corroborated it might be important for adjudicators to consider the circumstances in which those admissions were originally made.

Table 3 summarizes many of the basic assumptions that have been discussed concerning how much faith one can generally place in job applicants' statements concerning their possible involvement in various areas of prior misconduct. It appears that the only domain in which overt lies are frequently encountered is with denials made by applicants that they had not engaged in certain forms of misconduct. Unfortunately, it is often difficult for employers/adjudicators to differentiate between false and true denials. Figure 1 depicts a theoretical model that addresses the relationship of certain factors, which appear to affect the incidence of deceptive responses. After describing the model, the results of an empirical test of one of its segments is presented and discussed.


TABLE 3

LIKELIHOOD OF FALSE AND TRUTHFUL STATEMENT BEING MADE WITH RESPECT TO ACTS OF PRIOR MISCONDUCT

<table>
<thead>
<tr>
<th>Prior Infraction Committed</th>
<th>Prior Infraction Not Committed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission True - Admission</td>
<td>False - Admission</td>
</tr>
<tr>
<td>Made</td>
<td>(highly likely*)</td>
</tr>
<tr>
<td>False - Denial</td>
<td>True - Denial</td>
</tr>
<tr>
<td>(likelihood varies)</td>
<td>(highly likely)</td>
</tr>
</tbody>
</table>

*It should be noted that, although it is highly likely these admissions will be truthful, they may be understatements and should be viewed as reflecting the minimum likely levels.

Most of the components of the model are fairly self-explanatory. There are, however, a few issues which bear elaboration. First, it is interesting to note that people with a self-image of being very honest may be asked during the preemployment screening activities to provide details that might lead others to conclude differently. It appears that the higher the person's standards of integrity, both the more critical their self-judgment for minor indiscretions will be and the more likely that they will supply a fairly complete picture of them.

According to dissonance theory (Festinger and Aronson, 1968) being tempted to lie or cheat in certain situations results in cognitive dissonance and this leads to a change in attitude toward that behavior. A person who yields to the temptation is likely to have more justifications for lying or cheating in those situations, while a person who resists temptation would be more firmly opposed to it (Festinger, 1957).

Several factors, in addition to whether or not the person has previously resisted the temptation to lie during prior incidents of preemployment questioning, will affect the extent to which that person may be able to rationalize or justify telling lies, including:
Factors Affecting the Incidence of Deception

FIGURE 1

A MODEL DEPICTING THE FACTORS AFFECTING THE INCIDENCE OF DECEPTIVE RESPONSES

Does the person perceive a significant reason to lie?

Yes

Self image as honest?

Yes

Able to rationalize/justify telling a lie

No

Negative consequences of lie being detected perceived as being too high

Yes

No Lie

No

Likelihood of lie being detected perceived as too high?

Yes

Negative consequences of lie being detected perceived as being too high

No

Yes

No

No Lie

No

Lie

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a) whether the party asking the questions is perceived as "playing by the rules" - if that party violates certain aspects of the informal rules which the applicant feels are germane to the interview situation, it may be easier for the applicant to also justify violating them.

b) whether or not the questions asked are considered fair - if an honest response is perceived as having the potential to result in inappropriately eliminating that person from consideration (e.g., there is not perceived nexus between the issues and job suitability or it does not appear to reflect what the person is presently like - the applicant may be more inclined to rationalize lying.

c) whether or not the applicant is able to engage in social distancing from the questioner - the person may feel it is more acceptable to lie to certain entities (e.g., an enemy, someone with whom the applicant does not identify, a non-human paper and pencil test, someone out to hurt the applicant, etc.).

d) whether or not the applicant believes or rationalizes that a vast majority of people lie in similar situations and/or have engaged in similar acts of indiscretion. Perhaps, that is in part why many people like to hear about the indiscretions of others, especially those of people previously held on moral pedestals - to both reinforce their own rationalizations and reduce their level of guilt or cognitive dissonance.

Another set of factors which may affect applicant's ability to rationalize or justify telling lies during preemployment screening activities is how reprehensible they perceive others might find their false statements, as well as how reprehensible they personally feel it would be to make them. Among the considerations which appear to influence how negatively most people view different types of lies are:

a) Intent - Was it: 1) a conscious lie (as opposed to stating an incorrect fact that was believed to be true) and 2) intended to be not detected by the receiver (as opposed to obvious sarcasm)?

b) Potential for harming others - Would others be harmed and, if so, to what extent would the harm done to them be warranted?

c) Degree of selfishness involved - Who would be the primary beneficiary of the deception?

d) Overtness of the deception - Was it a direct lie or a half-truth?

e) Degree of coercion to lie - To what extent might either the individual or others be harmed (e.g., the perceived potential negative impact on their physical, emotional, economic, or social wellbeing) if that person told the truth. Flynn, Reichard and Slane (1987) reported that most people are more likely to cheat in order to avoid punishment,
Factors Affecting the Incidence of Deception

then to receive rewards. It appears reasonable to assume that the same relationship holds for lying.

f) **Predictability** - Should the person who is being lied to have expected that the liar's statement may have been deceptive? Among the components which affect expectations concerning whether others may attempt to deceive them are:

1) **the nature of the relationship between the sender and the receiver** (e.g., telling a close friend or member of the clergy a lie may be considered more reprehensible than telling a lie to a stranger or to one's enemy)

2) **the status of the person telling the lie** - Higher standards of honesty are expected for members of certain occupations (e.g., clergy vs. used car salesperson), age groups (e.g., adult vs. young child), institutions (e.g., cadets in a service academy vs. students in a public university), etc.

3) **the situation in which the lie is told** - In certain situations lies are condoned (telling young children that Santa Claus exists), somewhat expected (e.g., "let the buyer beware"), or completely unexpected (e.g., a physician intentionally falsely informing a patient that s/he has a serious illness).

Once again, the perceived reprehensibility of a false statement appears to also affect one's ability to rationalize or justify telling it. Generally, the more reprehensible the lie is considered, the more difficult it is for individuals who possess at least a certain degree of integrity to rationalize telling it, and consequently, the less likely it is to be told.

Personality may also affect the extent to which people engage in deceptive behavior. Several studies, which have analyzed Minnesota Multiphasic Personality Inventory (MMPI) responses (e.g., Block, 1965; Eichman, 1961, 1962; Welsh, 1956, 1965), suggest that the factors measured by that personality test can be boiled down to two principal dimensions - Anxiety (A) and Repression (R). It appears that the A Scale is associated with one's willingness to admit to or to endorse socially undesirable items (Wiggins and Rumrill, 1959; Edwards, 1964), as well as how much anxiety, self-doubt and inhibitedness that person displays (Duckworth and Duckworth, 1975 - for a more detailed description of the A scale see Graham, 1987, p. 160-164 and Dahlstrom, Welsh, and Dahlstrom, 1972, p. 234-239).

The aforementioned properties of the Anxiety scale may provide certain insights concerning the types of individuals who are more likely to admit to socially undesirable issues during various psychological and employment testing procedures. Simply restating the previously noted finding in a slightly different fashion, it appears that people who demonstrate more anxiety, self-doubt, and inhibitedness may be more likely to provide relatively complete descriptions of their past indiscretions and perceived inadequacies. This might be due to: 1) their being more concerned that their attempts to deceive others would be detected or result in harm to their
reputation, 2) their having greater abasement needs (see Edwards, 1959) or 3) that these types of people hold themselves to higher moral standards.

As previously mentioned, this study attempts to determine the extent to which subjects make derogatory admissions when confronted by questions addressing certain issues on both: a) the Inwald Personality Inventory and b) a preemployment polygraph test. It is believed that an experiment of this type might serve to supply valuable comparative information on the detection efficiency of those two preemployment screening procedures, as well as to partly assess the validity and utility of the proposed theoretical model within the context that underlies this study. It is assumed only two areas on the proposed model should be affected by the type of the preemployment screening procedure used. They are: 1) the ability of the person to rationalize telling a lie and 2) the perceived likelihood of the lie being detected. Of those two areas, it is believed the latter would play the predominate role in shaping the outcome. Specifically, it is hypothesized that the subjects would feel that the chances of their lies being detected would be much higher during the preemployment polygraph examination and that this would result in a significant increase in admissions, especially to the more serious forms of prior misconduct.

METHOD

Subjects:

The subjects consisted of 39 volunteers enrolled in a selected upper division criminal justice class at a large Midwestern University during the Spring 1986 semester. All of the students were either security management or law enforcement majors. Thirty-four of the subjects were male (87.2%). The age of the subjects ranged from 19 to 27 (M = 22.0, SD = 2.03).

The class from which the subjects were recruited had an end of the term enrollment of 62 students. After being informed about the study, students were told they could earn extra credit in that class for either: a) participating in this or another study, or b) attending one or two alternative extra credit sessions lasting the same length of time as the experiments, during which they would write practice essays to prepare for their final examination.

Procedure:

The subjects initially reported to a large auditorium, where they were asked to select a subject number from a box containing a large number of slips of paper with different numbers written on them. Each piece of paper also contained a message instructing the subjects to put the slip of paper that they selected into their wallet and to be careful not to either show it to others or to lose it. The subjects also were verbally instructed not to sit close to any of the other students and to refrain from putting their name or any other personal identifiers on the documents that they would be completing that evening.
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One of the instruments the subjects completed was the Inwald Personality Inventory. The subjects were informed that test was currently being used by many police departments in that state, including both its largest municipal police department and its state police force. The subjects were asked to complete the test in the same manner that they would if, and when, they took it as one of their preemployment screening examinations. The only exception was that instead of writing their name on their answer sheet, they were asked to write down their subject number. To serve as an incentive for the subjects to complete the test in the same manner that they would if they were taking it as part of a preemployment screening battery, they were informed that they would be able to receive feedback concerning their performance on the test and that in order for that feedback to be meaningful, they would have to answer the questions in the same manner that they would during an actual employment testing situation. Although the subjects knew at the time they took the Inwald Personality Inventory that they would later be given a polygraph test over many of those same issues, they also knew that the examiner would not have access to their IPI responses.

The second phase of the project involved administering a two hour preemployment polygraph examination to each of the subjects. Each subject was individually tested by the same person using procedures commonly employed in the field. The examiner utilized was a well qualified polygraph examiner who had previously administered over 3,000 field examinations. The examiner was not provided with any IPI results until after all of the subjects had completed the polygraph testing phase.

Prior to meeting with the examiner the subjects were informed that the polygraph test they would be given was: A) "real", in that it was the same type of test that is administered in the field, B) that the results were important—that "failing the test" in this situation might indicate that they would also fail it when being considered for employment, and C) that they should approach the examiner and the testing the same way they would if they were taking it as part of their preemployment screening phase.

RESULTS

A comparison was made of the admission rates associated with selected questions asking during the: a) the polygraph testing phase (i.e., during the pretest interview, during the actual testing, or after being confronted with the examiner's beliefs based upon the individual's responses) and b) the administration of the Inwald Personality Inventory (IPI). The questions selected for comparison in this study focused upon the subject's prior use of cocaine and the sales of drugs. The results from that analysis are presented in Table 4.

Little difference between the admission rates on the IPI and the polygraph testing was found concerning the issue of prior use of cocaine. Nine of the 39 subjects responded "false" to the statement "I have not tried cocaine" included on the Inwald. It appears that one of those nine subjects may have filled in that response incorrectly, because that subject did not admit to any
other use of drugs when completing either the Inwald or the polygraph testing. Eleven of the 39 subjects admitted during the polygraph testing procedure that they had used cocaine at least once in their life. Thus, the polygraph procedure netted 11 cocaine use admissions compared to the 8 or 9 admissions that were made during the Inwald.

Considerably more difference was noted between the two procedures with respect to the issue of prior drug sales. Five of the 39 subjects responded true to the statement "I once sold a small quantity of drugs to a friend". Nine of the same 39 subjects, however, noted at some point during the polygraph procedure that they had previously sold drugs.

### TABLE 4

**FREQUENCY OF SERIOUS ADMISSIONS (N = 39)**

<table>
<thead>
<tr>
<th></th>
<th>IPI Admissions</th>
<th>Polygraph Admissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cocaine Use</td>
<td>9*</td>
<td>11</td>
</tr>
<tr>
<td>Drug Sales</td>
<td>5</td>
<td>9</td>
</tr>
</tbody>
</table>

*One of these 9 admissions is suspected of being an answer sheet response error, because there was no other indication of any drug use by that subject on either the IPI or the polygraph results.*

The percentage of subjects who admitted to other selected infractions while completing the IPI and the polygraph testing are presented in Tables 5 and 6. The data reflects that a substantial number of derogatory admissions were induced by the IPI and that even a higher percentage resulted from the polygraph sessions.
Factors Affecting the Incidence of Deception

TABLE 5

PERCENTAGE OF SUBJECTS WHO ADMITTED DEROGATORY INCIDENTS ON THE INWALD PERSONALITY INVENTORY (N = 39)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have been arrested in my life. (T)</td>
<td>35.9%</td>
</tr>
<tr>
<td>I have had no fist fights since I was twenty years old. (F)</td>
<td>33.3%</td>
</tr>
<tr>
<td>I have smoked marijuana more than two times in a week. (T)</td>
<td>28.2%</td>
</tr>
<tr>
<td>I have never had unauthorized firearms in my possession. (F)</td>
<td>25.6%</td>
</tr>
<tr>
<td>In the future, if I were to commit a crime, I believe</td>
<td></td>
</tr>
<tr>
<td>I would probably not be caught. (T)</td>
<td>25.6%</td>
</tr>
<tr>
<td>I have not tried cocaine. (F)*</td>
<td>23.1%</td>
</tr>
<tr>
<td>I have smoked marijuana without other people around. (T)</td>
<td>20.5%</td>
</tr>
<tr>
<td>I was arrested in my youth over a minor incident. (T)</td>
<td>20.5%</td>
</tr>
<tr>
<td>More than once I have taken petty items from a store without paying. (T)</td>
<td>17.9%</td>
</tr>
<tr>
<td>I have been suspected from school. (T)</td>
<td>15.4%</td>
</tr>
<tr>
<td>I have tried hard drugs. (T)</td>
<td>15.4%</td>
</tr>
<tr>
<td>I smoke marijuana on social occasions. (T)</td>
<td>15.4%</td>
</tr>
<tr>
<td>I have been fired from a job. (T)</td>
<td>12.8%</td>
</tr>
<tr>
<td>I once sold a small quantity of drugs to a friend. (T)</td>
<td>12.8%</td>
</tr>
<tr>
<td>Since the age of twenty, I have taken merchandise without payment for it.</td>
<td>12.8%</td>
</tr>
<tr>
<td>I once had counseling for a problem. (T)</td>
<td>10.3%</td>
</tr>
<tr>
<td>I have never seen an image or vision that others did not see. (F)</td>
<td>10.3%</td>
</tr>
<tr>
<td>Sometimes I need a drink to relax. (T)</td>
<td>7.7%</td>
</tr>
<tr>
<td>I have taken valium or other tranquilizers in my life. (T)</td>
<td>7.7%</td>
</tr>
<tr>
<td>A bill collector has tried to find me. (T)</td>
<td>5.1%</td>
</tr>
<tr>
<td>I have been convicted of a crime. (T)</td>
<td>5.1%</td>
</tr>
<tr>
<td>I admit that I once took a small unauthorized amount of money from an employer. (T)</td>
<td>2.6%</td>
</tr>
<tr>
<td>I have seriously considered ending my own life. (T)</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

*This question was not included in the list of IPI critical items provided to employers for follow-up evaluation.
TABLE 6

PERCENTAGE OF SUBJECTS ADMITTING TO DEROGATORY INCIDENTS DURING THE POLYGRAPH SESSION
(N = 39)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of marijuana (ever)</td>
<td>87.2%</td>
</tr>
<tr>
<td>Use of marijuana (within the last year)</td>
<td>56.4%</td>
</tr>
<tr>
<td>Use of cocaine (ever)</td>
<td>28.2%</td>
</tr>
<tr>
<td>Drug sales (ever)</td>
<td>23.1%</td>
</tr>
<tr>
<td>Commission of a felony (excluding marijuana sales)</td>
<td>12.8%</td>
</tr>
<tr>
<td>Commission of a misdemeanor</td>
<td>48.7%</td>
</tr>
<tr>
<td>Employment theft (including food, supplies, etc.)</td>
<td>89.7%</td>
</tr>
</tbody>
</table>

(M = $148.85, SD = 231.1, Range = $3.00 to $1,010.00)

DISCUSSION

One of the more interesting findings was the relatively large proportion of subjects who made derogatory admissions on the IPI. This demonstrates the potential utility of asking job candidates integrity related questions. Putting it quite simply, if employers do not ask those types of questions, they cannot expect candidates to provide derogatory information about themselves. One advantage of using a paper and pencil test to initially raise those issues is that the procedure appears far more impersonal than having an interviewer ask the questions. In many instances neither the interviewer, nor the applicant, feels comfortable dealing with questions of this nature, and consequently, the issues are never raised. Other advantages include: a vast number of issues can be covered in a short period of time with little expense, little personal interaction between the test administrator and those completing the test is needed (group testing is often used), and all of the development and validation costs, as well as much of the responsibility for insuring the appropriateness of the instrument, is born by the organization providing the service.
Factors Affecting the Incidence of Deception

It is also important, however, to note the limitations of paper and pencil integrity tests. The experiment clearly demonstrates that many applicants can and will lie about certain issues when they complete these tests. Consequently, it does not appear paper and pencil integrity tests such as the IPI can effectively take the place of background investigations, polygraph testing, and other integrity screening procedures; rather, it appears that they should be used when warranted as an adjunct to them. In the case of the IPI, not only do its users receive a list of the derogatory admissions made by the applicants for follow-up, they also receive important information about both their candidates' personalities and how their applicants' scale scores compare to the norms established for law enforcement applicants.

It appears absolutely essential that potential employers recognize the fact that applicants will vary considerably on how honestly they answer questions addressing their levels of previous misconduct. Thus, unless one's level of integrity is controlled for by employers, those individuals who are more honest could be at a disadvantage compared to those with similar backgrounds who are less forthright in their responses. This is not a problem, however, when the severity and continuing nature of the incidents unquestionably warrants the applicants' exclusion from consideration. For example, no matter how honest and forthright AIDS patients are about their illness, they would not be considered acceptable candidates for being blood donors. Unfortunately, few employment hiring situations are this clear cut. In matters where the nexus between the admission and future job unsuitability is less clear-cut, employers might be unjustifiably and unwillingly excluding certain individuals who might have proven to be their most loyal and honest employees.

Although the high proportion of subjects in this study who admitted to engaging in prior forms of misconduct is unsettling, it appears fairly consistent with both the results gathered from anonymous self-report questionnaires (e.g., U.S. DHEW, 1979) and the breakdown of polygraph admissions reported by the Department of Defense (DoD, 1984). The perceptibly higher percentage of admissions to marijuana use questions in the present study (87.2% compared to 68.2% in the DoD study) and to cocaine use admissions (28.2% compared to 2.7% in the DoD study) appears primarily attributable to: 1) students with problem backgrounds may have been over represented in the present study given that they were probably the most motivated to volunteer for the experiment (to assess how they would perform on these types of screening measures), 2) the DoD sample was comprised exclusively of individuals who had already undergone and passed extensive background screening for being granted the highest level of security clearance offered by the United States, and 3) the DoD polygraph sessions were conducted between 1974 and 1979 when cocaine use was just beginning to increase at record levels. Other related temporal factors serving to exaggerate those differences include the time lag effects that stem from asking people whether they had ever used a specific drug and the limited range and dispersion of the distribution curve associated with the proportion of people who were consuming that drug plotted by both age and the year.

The results from this experiment appear to support the proposed model. The polygraph procedure resulted in more derogatory admissions than the IPI, especially with respect to questions that addressed the more serious forms of prior misconduct. It is believed that one of

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the reasons that the polygraph session generated more admissions was that the subjects probably felt that there was a higher likelihood that their lies would be detected as a consequence of that procedure being administered. In addition, when subjects lied about issues while completing the IPI: a) they may have found it easier to rationalize not telling the truth because they were not directly lying to a person and b) they did not have to be concerned about their nonverbal behavior "giving them away".

REFERENCES


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PROFESSIONAL ETHICS: COMMITMENT AND COMPETENCE

By

Dr. Guy G. Sayles, Jr.

All of us have chuckled about garbage collectors who want to be called "sanitation engineers;" about housekeepers who insist on the label "domestic managers," and about janitors who desire to be known as "work-place environmental coordinators."

In a classic work on the professions, Burton Bledstein told about the evolution of another skill:

On in America, for example, did undertakers in the nineteenth century sever their historical ties with cabinet-makers, manufacturers of funeral furniture or liverymen. They enhanced their prestige by called themselves "funeral directors," proposing to provide a full personal service for the bereaved from the moment of a cherished one's death to the maintenance of a grave site. The professional importance of an occupation was exaggerated when the ordinary coffin became a "casket," the sealed repository of a precious object; when a decaying corpse became a "patient" prepared in an "operating room" by an "embalming surgeon" and visited in a "funeral home" before being laid to rest in a "memorial park." In the 1890's, the title mortician appeared, suggested by the word physician, and the subject "mortuary science" soon entered the curriculum of accredited colleges ... The American public demanded service and at least the appearance of an acquired skill; middle class Americans quickly cashed in on the demand, appropriating and inventing the titles that glorified their status. A mortician was [according to H.L. Mencken] a "Doctor of Grief."[1]

Dr. Guy G. Sayles, Jr. is an Ethics, Leadership, and Management Consultant. This was a presentation at the American Polygraph Association Annual Seminar, Newport Beach, California on July 27, 1993. Reprints are available from Dr. Sayles at 6706 Manatee Court, Waldorf, Maryland 20603.
I am pleased to speak to this gathering of "forensic psychophysicologists." However, contrary to the conclusion you may have already jumped to, I want to speak in support of the emerging professionalization of your practice. I do not believe you are engaging in a merely cosmetic change of the image you present to the American public or in the image you have of yourselves. Instead, I believe that the professionalization of your practice is a necessary step in the ethical self-awareness and development of your field.

Nonetheless, using that phrase, forensic psychophysicologists, I am made cautious about inflated malapropism, or what language maven Richard Lederer calls "big word abusage." In his book *Anguished English*, Lederer gives a few examples:

We've sold our house and moved into one of those pandemoniums.

At the university, three classes of professors compromise the teaching staff.

The corporation has set up rules for the employees, and we expect you to live up to them sacrilegiously.

The defendant pleaded exterminating circumstances.

Senators are chosen as committee chairmen on the basis of senility.

I wish someone would make a decision around here. I'm tired of just hanging around in libido.[2]

Now ethics is, in part, about decision-making, so I am here to help you get out of your libido and reflect on some of the ethical dimensions of your practice of Forensic Psychophysiology.

I intend for my discussion, although it is rooted in history and philosophy, to be of practical use to you. I am sensitive to the charge that Laura Nash has leveled against those of us who come from outside of the every day demands of a task and propound ethical theories: "The academician ponders the intangible, savors the paradoxical, and embraces the peculiar; he or she speaks in a special language of categorical imperatives and deontological viewpoints that must be taken into consideration before a statement about honesty is to have any meaning."[3] It is because of such high-minded, expert irrelevance that most of us leave seminars like this one as confused as when we came in. I don't want to be what Nash has called a "Triassic reptile," who "lumbers along in the far past of Sunday School and Philosophy I," while the real issues of your practice remain un-addressed.[4]

While I aim at practicality and not at confusion, I must acknowledge what we already know: there is a great deal of confusion about ethics. *Time* magazine has declared the "death of ethics". The *Washington Post* decried the American society as "Bereft of conscience."
Education consultant Michael Josephson says, "there is a hole in the moral ozone." Alastair Walker says we are raising a generation of "moral stutterers." We are, personally and as a culture, confused about ethics. The confusion comes from the fact that ethics is neither a simple nor an easy discipline.

For some, what is ethical is the same as what is legal: if what I do is not in violation of the law, then it is ethical. However, there are a great many things which are legal—not punishable—but which are not good, true, and just.

All of us have struggled from time to time with the fact that a great many truly offensive expressions of opinion are legal under the First Amendment. Does their mere legality suffice to render them ethically praiseworthy? You can even argue, as I would, that it is far more just for a society to allow such expressions than to forbid them, but the issue of the ethical content of such expressions is left unaddressed.

Misleading advertising, manipulative salesmanship, ruthless bureaucratic politics, and the maligning of another’s character by suggestion and innuendo may all be legal without being ethical. I do not believe that simply considering ethics and legality to be identical with each other will give us much guidance in the living of an ethical life.

Others confine ethics to personal or private considerations. To be ethical is to be honest, fair, and charitable in one’s life as a private citizen, family member, and friend. Issues of ethics are for evenings and weekends, but competition and success at any cost are day-time, work-time values. It is as if ethics were an overcoat that could be removed when entering the workplace and put back on when leaving the office.

I would challenge the idea that ethics are matters merely of the personal and private sphere, and obviously you do, too, since you are making ethics a topic of this seminar. However, even though I challenge the idea of separating vocational ethics from personal ethics, I do acknowledge the difficulty involved in "on-the-job" ethics.

A little boy asked his father: "Papa, what is business ethics?" His father, a merchant, explained, "Well, it’s like this. A man comes into the store and makes a purchase. He pays with a crisp new $5 bill and leaves the store. As I put it in the cash register I discover that he’s given me not one but two $5 bills stuck together. Now business ethics comes in ... should I tell my partner?"

Paul Thayer, sentenced to a four year prison term for stock fraud during his management of the L.T.V. Corporation, reflecting on his errors, said, "Most of us have a child’s notion of ethics and a graduate school notion of finance, marketing, and management." While our skill
level grows, often our ethical awareness remains at more elementary levels. To engage in our work with high standards of ethics, we need to update our ethical education.

In the face of this ethical confusion, I offer a perspective which I believe can help us press beyond the merely legal into the truly ethical, and can help bridge the private-public, home-place/work-place gap. The perspective I offer is a renewed understanding of professional identity. Just what does it mean to be a "professional" and how can understanding what you do as a profession give guidance to the practice of forensic psychophysiology?

Popularly understood, a "professional" is a person who has a rare ability or valuable skill and, therefore, makes an inordinately vast sum of money. So we have "professional" athletes and "professional" entertainers. Historically, however, being a professional has meant far more than being well paid. Money has not always been the key to professional identity.

From a broad historical perspective, a profession is characterized by commitment and competence:[5]

1. Commitment to an over-arching, even transcendent, value.

2. Commitment to the good of "the client" (the person or group which the profession serves).

3. Commitment to the common good of the larger society.

4. Competence in the skills and disciplines necessary to the conduct of the profession.

5. Competence encouraged and enforced by mutual accountability to other professionals for the conduct of one's work.

We will consider each of these characteristics.

1. **Commitment to an over-arching, even transcendent, value**

A "professional" is a person whose behavior in all of life is governed by the values one professes. One is a professional by virtue of a profession of commitment to some higher, transcendent value or values.

With this view, to be a "professional" physician means that a doctor has committed himself or herself to serve the value of health.
To be a "professional" attorney or judge means that a lawyer has committed himself or herself to serve the value of justice.

For a soldier, the profession of commitment is to the ultimate value of peace. For a teacher or philosopher or scientist, the profession of commitment is to truth. For a political leader, the professed value is the common good; for a minister, the professed value is salvation.

Being a professional, then, is a matter of pledging and maintaining fidelity to the values of the profession. Being a professional means more than being a practitioner of a technique; it is to be a "professor" of some higher value or values.

Part of professional ethics, involves asking, "Does my conduct serve the value or values that I am professed to serve?" For instance, in a doctor's work with patients, with hospital institutions, and with insurance companies, an inquiry about professional ethics would begin and end with questions like, "In my conduct, am I serving the ultimate value of health in my conduct?" In an attorney's work with clients, with the courts, and with other law-enforcement institutions, questions about professional ethics would begin and end with questions like, "Does my behavior advance the cause of justice?"

What values do you serve in your work? What higher principles inform your work as forensic psychophysiolists? Knowing those values which you are professed to serve is the key to having and maintaining professional ethics.

The question about those values to which you are committed might be difficult to resolve. Indeed forensic scientists seem to share my sense of difficulty. Writing in the May 1989 issue of the Journal of Forensic Sciences, Douglas Lucas, who is the Director of The Centre of Forensic Sciences, Ministry of the Solicitor General, Toronto, Canada, writes:

By associating "ethics" with "duty" in a professional context, conduct that might be perceived as ethical for one profession because of its duty may well be seen to be unethical for another profession charged with a different duty. Nowhere is this more apparent (and often confusing) than in forensic science, which associates the professions of science, medicine, and the law.[6]

Lucas notes that people who are engaged in your kind of work share values with professionals in the world of science, medicine, and the law. In your case, it is necessary also to consider the values of professionals in the military and in education. Sorting through the value commitments which are at the heart of your work is at the core of both professional identity and professional ethics.
The process of sorting through to the core values to which a profession is committed is essential for at least a couple of very immediate and practical reasons.

Knowing that one's work grows out of a commitment to some core value or values energizes one for that work. Nothing is more common than the distressed or depressed person who has lost both enthusiasm and effectiveness for his or her work. At least a part of the reason for high levels of job stress and personal distress is traceable to an unawareness or a forgetfulness about why one does what one does. Victor Frankl, a famous psychologist, reflecting on his experience as a survivor of Nazi concentration camps has said: "A man can endure almost any what if he has a why." While I hope no one considers his or her work comparable to a concentration camp, Frankl's point is valid: the what of our lives becomes unbearable without a clear understanding of why. It is clarity about why that emerges when we sort through to the core values of a profession.

Additionally, keeping a commitment to core values saves a professional from the tyranny of technique. In professions where certain practices are repeated frequently--the same test given, the same briefs or reports prepared, the same kinds of cases seen--it is easy to allow the routine to dull critical judgement. The professional comes to rely solely on the technique or process, rather than bringing fresh and creative concentration to the work. Growth of insight then becomes limited, the progress of the profession is slowed, and the professional person becomes merely a technician. Techniques are tools, not goals; means, not ends. Commitment to the core values of the profession helps a professional recall that it is technique which is subordinate to those values and not the values which are subordinate to technique.

2. Commitment to the good of "the client."

Professional life is not only characterized by commitment to higher values but also by a commitment to serve others.

Such professional service involves an orientation to the good of the client. A professional's client is that person or group which has made a legitimate claim on the professional's values and skills.

Knowing whom the professional is serving is crucial and difficult. Take the instance of a defense attorney. An attorney's highest loyalty is to justice. In our judicial system, the seeking of justice is done in an adversarial climate. For such an adversarial system to function, prosecutors must amass and present effective evidence against the accused; defense attorneys must present counter evidence; and a judge and/or jury must weigh the claims and counter-claims in order to reach a verdict. Each component of the system serves the larger value of justice by serving well the client or interest that is given to that component. The assumption of an adversarial system is that justice is served when each part of the system functions well. As long
as we seek to serve justice through such an adversarial system, then a defense attorney's professional role is to serve, within the limits of truthfulness and other rules of the system, the best interests of his/her client.

What about a forensic psychophysiologist? What client or clients do you serve? The agency which sponsors your work? The government of which your agency is an arm? The person whom you examine? The larger scientific community?

In one article, titled "Ethics and the Forensic Sciences: Professional Autonomy in the Criminal Justice System," Mark S. Frankel, Head of the Office of Scientific Freedom and Responsibility for the American Association of the Advancement of Science, says:

At the root of many of the ethical dilemmas experienced by scientists who become professionally involved in the law's adversarial system is the clash of two cultures. Law is an adversarial process with a different set of operating procedures and values than science. For example, attorneys are free to interpret scientific evidence in a way that supports their client. Indeed, it is their ethical obligation to do so. Scientists, however, would not tolerate the arbitrary presentation of data or the deliberate concealment of unfavorable experimental outcomes. In science, the truth, wherever it may lead, serves everyone's interest. In the legal system, that which serves the interest of one's client is what one counts as the truth.[7]

It would seem to me that the scientific nature of your work would cause you to approach any involvement with one side or another in a dispute with some caution and restraint. As Frankel has suggested, the question is whether forensic scientists see themselves as "impartial educators" (assisting finders of fact) or "advocates" (without distorting or misrepresenting evidence)?[8] In either case, it is important for you to maintain the right and the obligation to draw conclusions only within the limits of your scientific findings. In limiting your conclusions to what your science can support, you best serve your client, other interested parties, and the higher values of your profession. In so doing you live-out the professional's commitment to the good of the client.

3. Commitment to the common good of the larger society

Professional service extends beyond a commitment to the good of immediate clients to the commitment to the common, or public, good. That is, society ought to be healthier, more just, more truthful, more peaceful, and wiser because of the activities of professionals.

Professionals make the effort to render service to the community beyond the limits of their clients. It is this larger service that is behind the customs of free indigent medical care provided by physicians and pro bono work by attorneys.
Let me suggest a way in which people who do what you do have a vested interest in service to the larger community. In my somewhat limited understanding of the physio-psychological nuances behind your work, it seems to me that your theories contain, in part, the assumption that people have been culturally conditioned or encoded to view truth-telling as right and good. So deep is this conditioning or encoding that the failure to tell the truth will result in levels of conflict and stress which manifest themselves in involuntary responses of the autonomic nervous system.

What happens to this theory when the deep cultural conditioning received in a society is not toward truth-telling? Unless you believe that a bias toward truth-telling is genetically encoded in human beings, your theory has a vested interest in a society which conditions its citizens to believe in honesty, truth, and fairness. To the degree that you are professional, you have an obligation both to the larger society and your own work to participate in building a truthful and just society, else the conditioning upon which your theory in part depends will be missing.

Professional identity and ethics, then, grow out of these commitments: to some higher value or values; to the good of the client; and to the larger society. Professional identity and ethics also require competence.

4. Competence in the skills and disciplines necessary to the conduct of the profession.

This obligation is self-evident. A patient has the right to expect that his or her physician has obtained and maintained the appropriate abilities in diagnosis and treatment. A client has the right to expect that his or her attorney has been trained to understand the intricacies of the law and the justice system. A student has the right to expect that his or her teacher is sufficiently informed and skilled to guide the student in the search for truth.

I have a friend who was hospitalized in order to have surgery to reset an ankle fracture that had not properly healed. On the night before his surgery, an orderly came to shave the area where the surgery was to be done. The orderly ordered my friend to turn over on his stomach and then began to shave his buttocks! When he asked why it was necessary to shave that area for ankle surgery, the orderly said, "Ankle surgery? I have you down for a skin graft!"

All of us have had, or know friends who have had, such experiences—or worse! Incompetence—a lack of careful skill and skillful care—is, to put it bluntly, unethical.

Competence involves knowing how to do what must be done and why it matters that it be done. Competence is not achieved once-and-for-all at the moment of graduation, certification, or licensure. Professionals have an obligation to grow in their competencies, to keep abreast of
the latest developments in the field, and to engage in continuing education and training. This obligation—to grow in competence—is a matter of ethical conduct.

When you are involved in the education, training, and supervision of forensic psychophysiology, the issue of equipping them with competence calls for your best energy and effort. Chris Argyris and Donald Shoem, in their important though somewhat arcane book, *Theory in Practice*, argue that many professional schools do not prepare their students well for their work. The ineffectiveness of professional education is rooted in an inability to bridge the gap between scholar-researchers who inform the profession and those who actually carry-out the work of the profession. Argyris and Shoem assert that the best kind of professional education bridges this chasm between theory and practice by teaching competence in "taking action and simultaneously reflecting on this action to learn from it."[9] This reflecting-while-acting or acting-while-reflecting they call the "capacity to learn how to learn," and they view it as "the foundation for future ethical competence."[10] I would assume that this sort of competence is an ethical requirement especially for persons whose professions depend greatly on the findings of scientific research. Only a person who has been trained to think critically and analytically while acting, not just before or after acting, is likely to formulate new scientific hypotheses or test them with appropriately nuanced experiments.

5. Competence encouraged and enforced by mutual accountability to other professionals for the conduct of one's work.

Professional accountability for competence is part of the ethical responsibility of a profession. Professionals monitor their own behavior through mutual accountability. Physicians have the American and State Medical Associations; attorneys have various bar associations. The National Education Association has set standards for educators that are used in many local school jurisdictions. Counselors are certified and held accountable by organizations like the American Association for Marriage and Family Therapy. Many forensic psychophysiology are members of the American Polygraph Association. Through these kinds of groups, professionals seek to be self-regulating, holding their members to high standards of competence and conduct. These groups vary greatly, however, in the degree to which they actually encourage and enforce professional standards and conduct.

Professionals have deemed self-regulation to be critical for at least two reasons. First, the members of one's own profession understand the unique skills and competencies which the profession requires, and these matters are not always readily understood by persons unfamiliar with the profession. It is the members of one's own profession, who understand the internal structure of it, who are more likely to be able to see breaches of competence and conduct. Who better to understand malpractice than those who practice?
Secondly, self-regulation is critical because the credibility of a profession is either enhanced or demeaned by the persons who are a part of it. Maintaining accountability for competence keeps high both the standards and the standing of a profession.

It seems to me that, as you continue to professionalize your practice, this matter of mutual accountability for standards and performance is a crucial part of establishing further credibility and maintaining it. Most professions find that mutuality--of cooperation and accountability--breaks down in the face of competition for resources and notoriety. Yet it is precisely mutuality that any profession must have in order to maintain credibility with a wider public. At some point, members of a profession have to subordinate ego--personal and corporate--to the greater good of the profession.

Mutual accountability is important for the external relationship of your profession to the wider culture. It is a matter of your public credibility. In October of 1992, Time ran a cover story called, "Lying--Everybody's Doing It!" In the accompanying article, the author wished for an ability to detect deception. He mentioned your profession.

The task would be easy if humans resembled Pinocchio ... with their noses growing longer each time they told a lie. People, unfortunately, can fib without suffering physiognomic changes. It would be helpful, then, if there were some hidden manifestation of lying, invisible to most people but clear to psychics or visionaries. The closest that real life has managed to come to this fictional power is the polygraph machine, which has a few serious drawbacks. It can be stumped by accomplished actors, or those delusional enough to believe their own statements, and even experts disagree on the machine's level of reliability. And lie detectors, of course, are impractical to haul out on nearly all the occasions--including first dates, tax audits, political rallies--when they might prove handy.

This paragraph reveals the degree to which both your profession's theory and practice are unknown to the larger public. He focuses on the instrument--"polygraph machine"--and speaks of "stumping the machine" rather than on the process of forensic psychophysiology in which the instrument is a tool. He also writes of the experts who disagree about the "machine's reliability." This paragraph, I think, represents the dominant cultural view of what you do, and only professional competence and advocacy, grounded in mutual accountability can help to overcome this view. You might wish to keep theory and practice secret, but secrecy about theoretical underpinnings is read, by those who do not know what you do, as defensiveness--as having something to hide. Credibility rests on ethical standards which include scientific openness, experimental excellence, and theoretical collaboration and development which do not thrive in the midst of turf battles.
In some ways, it seems to me, this is an opportune time for you to investigate and advocate openly the theories and practices of your profession. The culture is open to hearing from you. For example, psychologist Harriet Lerner, recently wrote a book entitled The Dance of Deception: Pretending and Truth Telling in Women's Lives. In one interesting passage, she wrote:

Some folks have bodies that won't let them lie. Or perhaps, more correctly, some folks are bodies that won't lie. ... Most of us can count on our bodies, like the dreams of our unconscious, to at least try to keep us honest. ... Our bodies react to our deceit, even to a single incident of lying, particularly if we feel conflicted and guilty about it.[12]

These perceptions about the mind-body connection are prominent in the cultural consciousness just now, as the popularity of the book and video series by Bill Moyers, Healing and the Mind, demonstrates. There is a wide-spread cultural consensus that psyche and soma are linked in profound ways. This moment is significant for you.

Not only is mutual accountability important for your public credibility, it is crucial for the internal integrity of your profession. Most professions rely on codes of conduct, or similar rules of behavior, as the sole means of ethical awareness. Often ethical education consists of being given the code of conduct, being asked to read it, participating in a cursory review of it, and then placing the code on the shelf—literally and figuratively.[13]

Unfortunately, the code out of sight often allows ethics to be out of mind. Management consultant Saul Gellerman was right when he said:

[People] who have done things that others found inexcusable were not, for the most part, amoral or unprincipled. They suffered, instead, from an all-too-common psychological quirk: they were out of touch with their own standards when they needed them most.[14]

Ethics are seldom actually rejected or cast aside; most people are not that callous. But it is much too easy to overlook the ethics that we already know.[15]

Those of you who are managers and leaders in this profession have a responsibility to be sure that those who work for and with you are not overlooking the ethics of your profession.

Gellerman makes two suggestions about how to keep ethics a front-burner issue. I pass them along, because I agree with them wholeheartedly. First, design a process in which the ethics code, or set of principles, has to be taken off the shelf on a regular basis. Gellerman says:
Ethics codes need to be reviewed with everyone periodically, and preferably in the most inefficient way—in small discussion groups, in detail, and at least quarterly. The booklet on the bookshelf can't do the job alone. Ethics, like any finely tuned machine, need preventive maintenance every so often.[16]

Second, designate a conscience for your organization, or as Gellerman puts it: "[C]harge certain people with remaining constantly alert, on behalf of everyone else, for ethical problems."[17]

Actions like these two will signal to everyone that ethics is not just a seminar topic or an addendum to the daily task, but an integral part of your professional identity.

My argument can be briefly summarized: To be a professional carries with it codes of conduct and character. A professional is a person who keeps commitments and demonstrates competence. Professional ethics involves the maintenance of these commitments and competencies.

A good and healthy society depends upon the quality of its leadership. It is rare for a nation, a community, or an institution to rise about the level of its leaders. Professionals are leaders. Leaders are professionals. It could well be that part of the ethical confusion and moral decline of our culture is related to the ethical confusion and moral decline of our professionals, our leaders. When doctors care more for the heft of their pocketbooks than the health of their patients, leadership in the crucial area of the health becomes confused. When attorneys care more for billable hours than for basic fairness, leadership in the area of justice is lost. When ministers care more for their status in society than for the salvation of men and women, spiritual leadership is forfeited. When government officials care more for being elected than for good government, political leadership is corrupted. You get the idea: whenever professionals drift from their core commitments, there is a deterioration in their influence and leadership.

Professional ethics matters for many reasons, but especially because a good society depends on the good leadership of committed and competent professionals.

Notes


[4] Ibid.


[8] Ibid.


[17] Ibid, 263.

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LIES, PROMISES, OR THREATS

THE VOLUNTARINESS OF CONFESSIONS

By

A. Louis DiPietro, J.D.

A confession is probably the most probative and damaging evidence that can be admitted against a defendant. To be admissible, due process mandates that, as a threshold requirement, a confession be voluntary and the product of an essentially free and unconstrained choice by its maker. This is in addition to the investigator's scrupulous compliance with Miranda and other constitutional rights of an accused. If the Government obtains a confession by means that overbear the will of the accused, the resulting confession will be excludable on the grounds of a denial of due process of law.

In considering whether a suspect gives a confession freely and voluntarily, courts examine all the attendant circumstances on a case-by-case basis. Police interrogation tactics that suggest overreaching, intimidation, or coercion may combine to defeat the free and independent exercise of the suspect's will, this rendering the resulting confession violative of due process.

Some courts may tolerate an officer's limited use of lies, promises, or threats, so long as they do not overcome the free will of the suspect. However, other courts find an officer's use of such interrogation tactics violative of due process. This article discusses the extent to which the use of lies, promises, or threats affects the voluntariness of confessions.

Interrogation Factors

A suspect's vulnerability, as well as the interrogation tactics employed, determines whether a particular suspect's will is overborne. By using a totality of the circumstances test to determine the voluntariness of a confession, courts recognize that different suspects are not equally susceptible to coercive police interrogation tactics. Thus, police tactics permissible in one case might overbear the will in another. Successful investigators can envision how various tactics in their interrogation arsenal will impact on the overall voluntariness determination and selectively employ only those tactics appropriate to the suspect and the circumstances.

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Before using such potentially coercive interrogation techniques as lies, promises, or threats, officers should carefully assess the suspect's background and personal characteristics, such as age, education, mental impairment, and physical condition, any of which may render the suspect more vulnerable to coercion. However, mentally or physically impaired individuals can furnish a voluntary confession if interrogating officers do not take advantage of such impairments to overcome the suspects' free will.[5]

While officers have no control over a suspect's personal characteristics, they do have considerable control over the environment in which the questioning takes place and the interrogation tactics employed. Therefore, before interviewing a suspect, officers should learn as much as possible about a suspect's background and then choose the appropriate mix of interrogation tactics and environmental factors for questioning with the goal of convincing the suspect to admit culpability without overbearing the suspect's will.

The Use of Lies, Trickery, or Deception

The use of lies, trickery, or deception does not always render an otherwise voluntary confession inadmissible. However, the use of such tactics is an important factor considered by courts in the totality of circumstances.[6]

Even though some deception may lawfully be used in a given case without affecting the overall voluntariness of a confession, investigators must avoid tricking a suspect into waiving Miranda rights.[7] Based on its effect on voluntariness, deception can be categorized as 1) lies that relate to a suspect's connection to the crime and 2) trickery that introduces extrinsic considerations.

Lies that Connect Suspect to the Crime

Most courts view police trickery that simply inflates the strength of the evidence against a defendant as not significantly interfering with the defendant's "free and deliberate choice" to confess. Lies concerning a suspect's connection to the crime do not lead the suspect to consider anything beyond individual beliefs regarding actual guilt or innocence, a moral sense of right and wrong, and judgment regarding the likelihood that the police had garnered enough valid evidence to link the suspect to the crime.[8]

Thus, a court ruled a confession was not rendered involuntary when an officer falsely told the defendant that the department had received a report that a witness had seen defendant's vehicle where the victim had been raped and that he would have to explain why his vehicle was
there. Likewise, falsely telling an accused that a victim identified him or that his fingerprints had been found did not render the resulting confessions inadmissible. Therefore, lies that merely relate to a suspect's connection to a crime often do not render a confession involuntary.

**Trickery that Falsely Introduces Extrinsic Evidence**

By contrast, trickery that introduces extrinsic considerations is far more likely to invalidate a confession. For example, in *Lynumn v. Illinois*, police told a female suspect that she was in jeopardy of losing welfare benefits and custody of her children, but offered to recommend leniency if she would confess. The court ruled that the police impaired her free choice by going beyond the evidence connecting her to the crime and introducing a completely extrinsic consideration in the form of an empty but plausible threat to take away something to which she and her children would otherwise be entitled.

Another court likewise ruled a confession involuntary when an investigator told a suspect three times that he could either have an attorney present during questioning or cooperate with the Government, but not both. The investigator also told the suspect that if he asked for a lawyer, it would permanently preclude his cooperation. These misrepresentations created in the defendant's mind a false sense that he must confess at that moment or forfeit any future benefit that might be derived from cooperating. The court held that the defendant's decision to confess was the product of trickery that became coercive, thus rendering the confession involuntary.

Another extrinsic factor where courts frequently find coercion is when investigators lead the accused to believe that failure to confess will result in adverse consequences for others. In *Spano v. New York*, the suspect's friend, a police academy recruit, told the suspect that the officer would lose his new job if the suspect failed to cooperate. The defendant's subsequent statement was held involuntary.

**THE EFFECT OF PROMISES ON VOLUNTARINESS**

In *Arizona v. Fulminante*, the Supreme Court used a totality of circumstances test to determine that a confession made to an informant in exchange for the promise of protection from other prison inmates was involuntary because it was coerced by a credible threat of physical violence. While some courts will not accept confession induced by either direct or implied promises, other courts determine the coerciveness of an officer's promises based on the consideration of the following factors:

1) Whether the officer's promise is the proximate cause of the confession
2) Whether the defendant relies on the promise in making the confession[18]

3) Whether the promise is fulfilled[19]

4) Whether the officer's statements come after police give Miranda warnings[20]

5) Whether the defendant is vulnerable to such statements, the delay between Miranda warnings and the confession, and how long it takes to obtain the confession[21]

6) Whether the accused solicits the promise[22] and

7) Whether the accused reasonably believes that the promisor has the power or authority to execute it.[23]

Moreover, not every statement an investigator makes to the accused is a "promise."

For purposes of determining the voluntariness of a confession, a promise is an offer to perform or withhold some future action within the control of the promisor that will have an impact upon the defendant; a promise is not the same thing as a prediction about future events.[24] Generally, an admonition that it will be in the accused's best interest to tell the truth will not render a confession involuntary.[25]

In Miller v. Fenton,[26] a police officer used a "good guy" approach to offer encouraging words of comfort regarding the suspect's need for psychiatric treatment and made frequent assurances designed to make the defendant feel more comfortable about speaking to unburden himself. The U.S. Court of Appeals stated:

[T]he interrogator may play on the suspect's sympathies or explain that honesty might be the best policy for a criminal who hopes for leniency from the state. ... Those ploys may play a part in the suspect's decision to confess, but so long as that decision is a product of the suspect's own balancing of competing considerations, the confession is voluntary.[27]

Promises of Leniency

Semantics become extremely important when determining whether an officer violates due process with a promise of leniency, as compared to a promise that simply causes a suspect to hope. Generally, courts hold that beliefs or hopes arising internally from the operation of a defendant's mind to be insufficient to establish that a promise of leniency induced the defendant's confession.[28] Conversely, a promise of leniency usually renders a confession involuntary when it is relied upon or prompts a defendant to confess.[29] Therefore, investigators should avoid
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making promises of mitigation of punishment. However, an officer's statements that simply suggest hope without promising leniency are generally considered by the courts to be insufficient inducement to render a subsequent confession inadmissible.[30]

Promises to Tell Authorities of Cooperation

Most courts hold that officers' promises to suspects that their cooperation will be brought to the attention of the prosecutor or court is merely one of the circumstances that determine whether a defendant's statement is freely and voluntarily given.[31] For example, in United States v. Nash,[32] an investigator told an arrestee that he would make the arrestee's cooperation known to the U.S. Attorney's Office but gave no guarantee of a reduced sentence. Although the agent also stated that cooperating defendants generally "fared better time-wise," these statements did not amount to illegal inducement.

However, it is important to note that other courts do not permit such statements.[33] Even in those jurisdictions that do permit an interrogating officer to promise that the defendant's cooperation will be communicated to the proper authorities, investigators should not assume that they are also permitted to represent that a defendant's failure to cooperate will likewise be communicated to the prosecutor. This latter promise is considered by the courts to be much more coercive.[34]

Promises of Collateral Benefit

Courts distinguish between promises of leniency in the criminal proceeding against the defendant from promises of held involving some collateral benefit.[35] While promises of a collateral benefit in combination with other coercive factors can render a confession involuntary, such promises are generally considered less coercive than promises directly relating to the criminal proceedings against the accused.[36] For example, courts have found confessions to be voluntary, even when interrogating officers promised the following collateral benefits:

1) Promise to release girlfriend who was being held in custody[37]

2) Promise to release brother[38]

3) Promise to see that defendant receives psychological help[39]

4) Promise that son would not be charged if defendant gave statement exculpating son[40]

5) Promise that defendant receive rape counseling[41]
6) Promise to secure treatment for withdrawal from drug addiction[42]

7) Promise to obtain treatment for alcoholism.[43]

Interrogators should understand that just because a court approved the above promises in the context of a particular interrogation does not mean that such promises would be approved in every case because voluntariness is a fact-specific determination made on a case-by-case basis. In that regard, courts found the following promises coercive and ruled the resulting confessions involuntary:

1) Promise to protect the accused[44]

2) Promise to protect the accused's family,[45] and

3) Promise not to arrest defendant.[46]

THREATS VIEWED AS INHERENTLY COERCIVE

Courts view an interrogating officer's use of threats as inherently coercive and a significant factors that weighs heavily against a finding of voluntariness under the totality of circumstances test. However, if threats by police have nothing to do with the defendant's decision to confess, the confession may be admissible.[47]

The Supreme Court has held that a credible threat of physical violence is sufficient to render a confession involuntary. In a kidnapping case, the U.S. Court of Appeals for the Sixth Circuit held the defendant's confession to be involuntary because the officer's physical abuse of the co-arrestee created a coercive environment in which the defendant reasonable feared that he, too, was threatened with physical abuse.[48] Threatening additional or more serious charges to induce the defendant to confess is viewed as highly coercive, but confessions following such threats are not always held inadmissible.[49]

Courts usually find confessions inadmissible when extracted by threats to arrest or charge a relative or friend. However, the mere fact that an accused may be self-motivated to confess in order to exonerate or bring about the release of another is not always, standing alone, sufficient to make the confession involuntary.[50] Moreover, courts applying the totality of circumstances test have admitted confessions following threats to arrest or charge another,[51] especially where the police actually have probably cause to arrest.[52]

Finally, police statements that threaten interference with normal family relationships are viewed as very coercive by the courts. For example, the Supreme Court held a confession to be
coerced when officers told an accused that if she did not cooperate her children would be deprived of State financial assistance and taken from her. Likewise, in United States v. Tingle, investigators, in an effort to cause Tingle to fear that if she failed to cooperate she would not see her young child for a long time, told her that she might not see her child for a while if she went to prison. The U.S. Court of Appeals for the Ninth Circuit held that by preying upon the defendant's maternal instinct, the investigators exerted improper influence that coerced the defendant's confession.

CONCLUSION

The Supreme Court has stated that "admissions of guilt by wrongdoers, if not coerced, are inherently desirable." Obviously, it is unrealistic to assume that most suspects will simply come forward to confess their guilt. The cases discussed in this article reflect that investigators have a great deal of room for creativity and ingenuity in devising a strategy for questioning a suspect.

While courts may tolerate some police gamesmanship, so long as the games do not overcome the suspect's will, interrogators need to carefully tailor their tactics and surrounding circumstances to each individual defendant. If Government coercion does not play a significant role in inducing the defendant's inculpatory statement, most courts will deem the confession voluntary under the totality of the circumstances. Criminal investigators preparing to interview a suspect should carefully assess and discuss with their legal advisors whether the use of a coercive interrogation technique involving either lies, promises, or threats will render involuntary any confession obtained.

* * * * *

Endnotes


[5] United States v. Pelton, 835 F.2d 1067 (4th Cir. 1987), cert. denied, 108 S.Ct. 1741 (1988) (despite claims of intoxication, suspect still made voluntary statements); United States v. Yunis, 859 F.2d 953 (D.C. Cir. 1988) (despite broken wrists, seasickness, language difficulties, poor accommodations, repeated interrogations, confession was voluntary); People v. Hendricks, 495 N.E.2d 85 (1986) (mere fact that a person has been without sleep for an extended period of time, prior to making a statement, does not render it automatically involuntary); United States v. Macklin, 900 F.2d 948 (6th Cir. 1990), cert. denied, 111 S.Ct. 116 (if mentally impaired citizens were to be regarded as lacking the free will necessary to make a voluntary confession, then logically they could also be denied other rights of citizenship, such as the right to testify, the right to make contracts, and the right to vote. Such a rule would not be in the interest of mentally impaired citizens generally.)


[7] Miranda v. Arizona, 385 U.S. 436, 476 (1966) ("Moreover, any evidence that the accused was ... tricked ... into a waiver will, of course, show the defendant did not voluntarily waive his privilege.") While the confession itself must be voluntary to be admissible, the waiver of Miranda rights, where required, must not only be voluntary but also knowing and intelligent. Deception regarding the nature of rights being waived or the consequences of that decision denies suspects the requisite level of comprehension of their rights to make a knowing and intelligent Miranda waiver. See Collazo v. Estelle, 940 F.2d 311 (9th Cir. 1991), Stokes v. Singletary, 952 F.2d 1567 (11th Cir. 1992).


[9] Id.


[12] However, a distinction can be made between false verbal assertions on the one hand and the fabrication of tangible or documentary evidence on the other. The latter police conduct is more likely to offend notions of fundamental fairness. In Florida v. Cayward, 552 So.2d 971 (Fla.App. 2 Dist. 1989), review dismissed, 562 So.2d 347 (Fla. 1990), police fabricated two scientific reports that established the semen stains on victim's underwear came from defendant, showed the reports to defendant, and explained their significance. Differentiating between verbal misrepresentations and actual manufactured evidence, the Florida court held that the police conduct overstepped the line, rendering the confession violative of due process.
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[25] Rachlin v. United States, 723 F.2d 1373 (8th Cir. 1983) (agents may have told suspect that it was in his best interest to cooperate--confession held voluntary); United States v. Vera, 701 F.2d 1349 (11th Cir. 1983) (agent told suspect that he could help himself by cooperating--confession held voluntary); Smith v. Walton, 769 P.2d 1017 (Ariz. 1989) ("Give yourself a chance," "To lie isn't going to help," and "It's nothing that can't be worked out," were not direct or implied promises that rendered confession involuntary.)


[27] Id. at 605.

[29] People v. Conte, 365 N.W.2d 648 (Mich. 1985); State v. Porter, 455 N.W.2d 787 (Neb. 1990) (police interrogator admitted on cross-examination that confessions obtained by implied promises of leniency--court held confession inadmissible); Finke v. State, 468 A.2d 353, 371 (Md.App. 1983), cert. denied, 105 S.Ct. 529 (telling defendant that if he "tells the truth" then police will "go to bat for him" or help with the State's attorney is coercing a confession).

[30] Neil v State, 522 N.E.2d 912 (Ind. 1988); Collins v. State, 509 N.E.2d 827 (Ind. 1987); United States v. Rutledge, 900 F.2d 1127 (7th Cir. 1990) (in response to defendant's question whether cooperation would be helpful, the officer responded, "All cooperation is helpful." The court held Government's conduct did not exceed permissible limits.); Miller v. Fenton, 796 F.2d 598, 610 (3d Cir. 1986), ("Indirect promises do not have the potency of direct promises").

[31] State v. Tapia, 767 P.2d 5 (Ariz. 1988) (under some circumstances, direct promises that officers will tell prosecutor or judge if defendant cooperates are permissible); Lord v. State, 531 N.E.2d 207 (Ind. 1988) ("[I]f I can get [prosecutor] down here, would you tell the truth, if he would cut you a deal?" did not constitute a promise that coerced defendant's confession); State v. Janice, 565 A.2d 553 (Conn.App. 1989); United States v. Hernandez, 574 F.2d 1362 (5th Cir. 1978); Williams v. Johnson, 845 F.2d 906 (11th Cir. 1986) (Secret Service agent's statement that he would inform appropriate authorities if defendant cooperated held not the kind of statement that would render confession involuntary).


[33] Pennsylvania v. Gibbs, 553 A.2d 409 (Pa.S.Ct.) cert. denied, 110 S.Ct. 403 (1989) (police improperly induced confession by answering suspect's question about what good his confession would do by stating that his cooperation would be brought to the prosecutor's attention); United States v. Motll, 946 F.2d 1366 (8th Cir. 1991) (suggesting that a statement that the suspect's cooperation would be brought to the attention of the prosecutor is different than saying cooperation would be made known to the court).

[34] A defendant may not be made to suffer for his silence because of the 5th Amendment privilege against self-incrimination. There is no legitimate purpose for such a statement. Telling an accused that failure to cooperate will be reported is coercive, and courts disapprove of same. See United States v. Tingle, 658 F.2d 1332, 1336 (9th Cir. 1981).

[35] See, e.g., Miller v. Fenton, 796 F.2d at 610.

[36] Id.

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[40] Bruno v. State, 574 So.2d 76 (Fla. 1991), cert. denied, 112 S.Ct. 112.


[43] Quandrini v. Clusen, 864 F.2d 577 (7th Cir. 1989).


[49] Lindsey v. Smith, 820 F.2d 1137 (11th Cir. 1987), cert. denied, 489 U.S. 1059 (confession voluntary where defendant initiated discussion with police and knowingly and voluntarily waived rights despite threat of capital murder charge.) See also People v. Thompson, 785 P.2d 857 (Ca. 1990), cert. denied, Thompson v. California, 111 S.Ct. 226; State v. Strain, 779 P.2d 221 (Utah 1989) (despite detective's improper threat of first-degree murder charge and possible execution and "guarantee" of second-degree murder charge if defendant admitted his involvement, case remanded to determine whether officer's improper statements induced confession).

[50] Vogt v. United States, 156 F.2d 308 (5th Cir. 1946) (the fact that an accused undertakes to shoulder the entire burden in order to exculpate someone else, does not, of itself, render the confession involuntary); Jackson v. State, 280 A.2d 914, 917 (Md. 1971); People v. Steger, 546 P.2d 665 (Cal. 1976).
[51] Phillips v. State, 139 N.W.2d 41 (Wis. 1966) (threat to take girlfriend into custody did not render confession involuntary); People v. Gamble, 353 N.E.2d 136 (Ill. 1976) (threat to charge wife with murder did not invalidate confession).

[52] Allen v. McCotter, 804 F.2d 1362 (5th Cir. 1986) reh'g denied 808 F.2d 1520 (threat to file charges against defendant's wife did not render confession involuntary where officer, in fact, had probably cause to arrest wife). See also Martini v. Kemp, 760 F.2d 1244 (11th Cir. 1985).


[54] 685 F.2d 1332 (9th Cir. 1981).


[56] People v. Anderson, 364 N.E.2d 1318 (N.Y. 1977) ("[T]he test of involuntariness may be easier to apply than to verbalize. A series of circumstances may each alone be insufficient to cause a confession to be deemed involuntary, but yet in combination they may have that qualitative and quantitative effect... and, considering the variety of techniques that may suggest themselves to interrogators, it may be undesirable to prescribe inflexible and all-inclusive limitations in advance to guide interrogating law enforcement officers on all occasions. Failure to do so would not necessarily permit resort to coercion with impunity. Such tactics, when applied, tend to tell their own tale.").


[58] People v. Branch, 805 P.2d 1075 (Col. 1991); McCall v. Dutton, 863 F.2d 454, 459 (6th Cir. 1988), cert. denied, 490 U.S. 1020 (1989) (three-factor test for confession to be "involuntary" under due process requires 1) objectively coercive police activity that 2) was sufficient to overbear the will of the accused (considering subjective state of mind) and 3) because of the coercive police activity the defendant's will was overborne).

NOTE: Law enforcement officers of other than Federal jurisdiction who are interested in this article should consult their legal advisor. Some police procedures ruled permissible under Federal constitutional law are of questionable legality under State law or are not permitted at all.

* * * * *
SUPREME COURT OF THE UNITED STATES

No. 92-102

William Daubert, et. ux., etc. et al., Petitioners

v.

Merrell Dow Pharmaceuticals, Inc.

113 S.Ct. 2786, 125 L.Ed.2d 469, 509 U.S. ___

On Writ of Certiorari to the United States Court of Appeals for the Ninth Circuit

SYLLABUS


Petitioners, two minor children and their parents, alleged in their suit against respondent that the children's serious birth defects had been caused by the mothers' prenatal ingestion of Bendectin, a prescription drug marketed by respondent. The District Court granted respondent summary judgment based on a well-credentialed expert's affidavit concluding, upon reviewing the extensive published scientific literature on the subject, that maternal use of Bendectin has not been shown to be a risk factor for human birth defects. Although petitioners had responded with the testimony of eight other well-credentialed experts, who based their conclusion that Bendectin can cause birth defects on animal studies, chemical structure analyses, and the unpublished "reanalysis" of previously published human statistical studies, the court determined that this evidence did not meet the applicable "general acceptance" standard for the admission of expert testimony. The Court of Appeals agreed and affirmed, citing Frye v. United States, 54 App. D.C. 46, 47, 293 F. 1013, 1014, for the rule that expert opinion based on a scientific technique is inadmissible unless the technique is "generally accepted" as reliable in the relevant scientific community.

HELD: The Federal Rules of Evidence, not Frye, provide the standard for admitting expert scientific testimony in a federal trial.

Although this case does not immediately address admissibility of polygraph evidence, it does resound Frye, a 1923 decision that excluded evidence from an early form of instrumental lie detection. Daubert will be important in future cases involving the admissibility of polygraph results in federal courts. [Ed.]
(a) Frye's "general acceptance" test, was superseded by the Rules' adoption. The Rules occupy the field, United States v. Abel, 469 U.S. 45, 49, and, although the common law of evidence may serve as an aid to their application, id., at 51-52, respondent's assertion that they somehow assimilated Frye is unconvincing. Nothing in the Rule as a whole or in the text and drafting history of Rule 702, which specifically governs expert testimony, gives any indication that "general acceptance" is a necessary precondition to the admissibility of scientific evidence. Moreover, such a rigid standard would be at odds with the Rules' liberal thrust and their general approach of relaxing the traditional barriers to "opinion" testimony.

(b) The Rules--especially Rule 702 place appropriate limits on the admissibility of purportedly scientific evidence by assigning to the trial judge the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand. The reliability standard is established by Rule 702's requirement that an expert's testimony pertain to "scientific ... knowledge," since the adjective "scientific" implies a grounding in science's methods and procedures, while the word "knowledge" connotes a body of known facts or of ideas inferred from such facts or accepted as true on good grounds. The Rule's requirement that the testimony "assist the trier of fact to understand the evidence or to determine a fact in issue" goes primarily to relevance by demanding a valid scientific connection to the pertinent inquiry as a precondition to admissibility.

(c) Faced with a proffer of expert scientific testimony under Rule 702, the trial judge, pursuant to Rule 104(a), must make a preliminary assessment of whether the testimony's underlying reasoning or methodology is scientifically valid and properly can be applied to the facts at issue. Many considerations will bear on the inquiry, including whether the theory or technique in question can be (and has been) tested, whether it has been subjected to peer review and publication, its known or potential error rate, and the existence and maintenance of standards controlling its operation, and whether it has attracted widespread acceptance within a relevant scientific community. The inquiry is a flexible one, and its focus must be solely on principles and methodology, not on the conclusions that they generate. Throughout, the judge should also be mindful of other applicable Rules.

(d) Cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof, rather than wholesale exclusion under an uncompromising "general acceptance" standard, is the appropriate means by which evidence based on valid principles may be challenged. That even limited screening by the trial judge, on occasion, will prevent the jury from hearing of authentic scientific breakthroughs is simply a consequence of the fact that the Rules are not designed to seek cosmic understanding but, rather, to resolve legal disputes.

951 F.2d 1128, vacated and remanded.

BLACKMUN, J., delivered the opinion for a unanimous Court with respect to Parts I and II-A, and the opinion of the Court with respect to Parts II-B, II-C, III, and IV, in which, WHITE, O'CONNOR, SCALIA, KENNEDY, SOUTER, and THOMAS, JJ., joined. REHNQUIST, C.J., filed an opinion concurring in part and dissenting in part, in which STEVENS, J., joined.

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JUSTICE BLACKMAN delivered the opinion of the Court.

In this case we are called upon to determine the standard for admitting expert scientific testimony in a federal trial.

I

Petitioners Jason Daubert and Eric Schuller are minor children born with serious birth defects. They and their parents sued respondent in California state court, alleging that the birth defects had been caused by the mothers' ingestion of Bendectin, a prescription anti-nausea drug marketed by respondent. Respondent removed the suits to federal court on diversity grounds.

After extensive discovery, respondent moved for summary judgment, contending that Bendectin does not cause birth defects in humans and that petitioners would be unable to come forward with any admissible evidence that it does. In support of its motion, respondent submitted an affidavit of Steven H. Lamm, physician and epidemiologist, who is a well-credentialed expert on the risks from exposure to various chemical substances.1 Doctor Lamm stated that he had reviewed all the literature on Bendectin and human birth defects--more than 30 published studies involving over 130,000 patients. No study had found Bendectin to be a human teratogen (i.e., a substance capable of causing malformations in fetuses). On the basis of this review, Doctor Lamm concluded that maternal use of Bendectin during the first trimester of pregnancy has not been shown to be a risk factor for human birth defects.

Petitioners did not (and do not) contest this characterization of the published record regarding Bendectin. Instead, they responded to respondent's motion with the testimony of eight experts of their own, each of whom also possessed impressive credentials.2 These experts had

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1Doctor Lamm received his master's and doctor of medicine degrees from the University of Southern California. He has served as a consultant in birth-defect epidemiology for the National Center for Health Statistics and has published numerous articles on the magnitude of risk from exposure to various chemical and biological substances. App. 34-44.

2For example, Shanna Helen Swan, who received a master's degree in biostatics from Columbia University and a doctorate in statistics from the University of California at Berkeley, is chief of the section of the California Department of Health and Services that determines causes of birth defects, and has served as a consultant to the World Health Organization, the Food and Drug Administration, and the National Institutes of Health. App. 113-114, 131-132. Stewart A. Newman, who received his master's and a doctorate in chemistry from Columbia University and the University of Chicago, respectively, is a professor at New York Medical College and has spent over a decade studying the effect of chemicals on limb development. App. 54-56. The credentials of the others are similarly impressive. See App. 61-66, 73-80, 148-153, 187-192, and Attachment to Petitioners' Opposition to Summary Judgment, Tabs 12, 20, 21, 26, 31, 32.
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concluded that Bendectin can cause birth defects. Their conclusions were based upon "in vitro" (test tube) and "in vivo" (live) animal studies that found a link between Bendectin and malformations; pharmacological studies of the chemical structure of Bendectin that purported to show similarities between the structure of the drug and that of other substances known to cause birth defects; and the "reanalysis" of previously published epidemiological (human statistical) studies.

The District Court granted respondent's motion for summary judgment. The court stated that scientific evidence is admissible only if the principle upon which it is based is "sufficiently established to have general acceptance in the field to which it belongs." 727 F.Supp. 570, 572 (SD Cal. 1989), quoting United States v. Kilgus, 571 F.2d 508, 510 (CA 9 1978). The court concluded that petitioners' evidence did not meet this standard. Given the vast body of epidemiological data concerning Bendectin, the court held, expert opinion which is not based on epidemiological evidence is not admissible to establish causation. 727 F. Supp., at 575. Thus, the animal-cell studies, live-animal studies, and chemical-structure analyses on which petitioners had relied could not raise by themselves a reasonably disputable jury issue regarding causation. Ibid. Petitioners' epidemiological analyses, based as they were on recalculations of data in previously published studies that had found no causal link between the drug and birth defects, were ruled to be inadmissible because they had not been published or subjected to peer review. Ibid.

The United States Court of Appeals for the Ninth Circuit affirmed. 951 F.2d 1128 (1991). Citing Frye v. United States, 54 App. D.C. 46, 47, 293 F. 1013, 1014 (1923), the court stated that expert opinion based on a scientific technique is inadmissible unless the technique is "generally accepted" as reliable in the relevant scientific community. 951 F.2d at 1129-1130. The court declared that expert opinion based on a methodology that diverges "significantly from the procedures accepted by recognized authorities in the field ... cannot be shown to be 'generally accepted as a reliable technique.'" Id., at 1130, quoting United States v. Solomon, 753 F.2d 1522, 1526 (CA 9 1985).

The court emphasized that other Courts of Appeals considering the risks of Bendectin had refused to admit reanalyses of epidemiological studies that had been neither published nor subjected to peer review. 951 F.2d at 1130-1131. Those courts had found unpublished reanalyses "particularly problematic in light of the massive weight of the original published studies supporting [respondent's] position, all of which had undergone full scrutiny from the scientific community." Id., at 1130. Contending that reanalysis is generally accepted by the scientific community only when it is subjected to verification and scrutiny by others in the field, the Court of Appeals rejected petitioners' reanalyses as "unpublished, not subjected to the normal peer review process and generated solely for use in litigation." Id., at 1131. The court concluded that petitioners' evidence provided an insufficient foundation to allow admission of expert testimony that Bendectin caused their injuries and, accordingly, that petitioners could not satisfy their burden of proving causation at trial.

We granted certiorari, ____ U.S. ____ (1992), in light of sharp divisions among the courts regarding the proper standard for the admission of expert testimony. Compare, e.g., United States

II

A

In the 70 years since its formulation in the Frye case, the "general acceptance" test has been the dominant standard for determining the admissibility of novel scientific evidence at trial. See E. Green & C. Nesson, Problems, Cases, and Materials on Evidence 649 (1983). Although under increasing attack of late, the rule continues to be followed by a majority of courts, including the Ninth Circuit.3

The Frye test has its origins in a short and citation-free 1923 decision concerning the admissibility of evidence derived from a systolic blood pressure deception test, a crude precursor to the polygraph machine. In what has become a famous (perhaps infamous) passage, the then Court of Appeals for the District of Columbia described the device and its operation and declared:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs. 54 App. D.C., at 47, 293 F., at 1014 (emphasis added).

Because the deception test had "not yet gained such standing and scientific recognition among physiological and psychological authorities as would justify the courts in admitting expert testimony deduced from the discovery, development, and experiments thus far made," evidence of its results was ruled inadmissible. Ibid.

The merits of the Frye test have been much debated, and scholarship on its proper scope and application is legion.4 Petitioners' primary attack, however, is not on the content but on the

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continuing authority of the rule. They contend that the Frye test was superseded by the adoption of the Federal Rules of Evidence.\(^5\) We agree.

We interpret the legislatively-enacted Federal Rules of Evidence as we would any statute. Beech Aircraft Corp. v. Rainey, 488 U.S. 153, 163 (1988). Rule 402 provides the baseline:

All relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by Act of Congress, by these rules, or by other rules prescribed by the Supreme Court pursuant to statutory authority. Evidence which is not relevant is not admissible.

"Relevant evidence" is defined as that which has "any tendency to make the existence of any fact that is of consequence to the determination of the action more probably or less probable than it would be without the evidence." Rule 401. The Rule's basic standard of relevance thus is a liberal one.

Frye, of course, predated the rules by half a century. In United States v. Abel, 469 U.S. 45 (1984), we considered the pertinence of background common law in interpreting the Rules of Evidence. We noted that the Rules occupy the field, id., at 49, but, quoting Professor Cleary, the Reporter, explained that the common law nevertheless could serve as an aid to their application.

In principle, under the Federal Rules no common law of evidence remains. 'All relevant evidence is admissible, except as otherwise provided ...' In reality, of course, the body of common law knowledge continues to exist, though in the somewhat altered form of a source of guidance in the exercise of delegated powers. Id., at 51-52.

We found the common-law precept at issue in the Abel case entirely consistent with rule 402's general requirement of admissibility, and considered it unlikely that the drafters had intended to change the rule. Id. at 50-51. In Bourjaily v. United States, 483 U.S. 171 (1987), on the other hand, the Court was unable to find a particular common-law doctrine in the Rules, and so held it superseded.

Here there is a specific Rule that speaks to the contested issue. Rule 702, governing expert testimony, provides:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

Nothing in the text of this Rule establishes "general acceptance" as an absolute prerequisite to admissibility. Nor does respondent present any clear indication that Rule 702 or the Rules as a whole were intended to incorporate a "general acceptance" standard. The drafting history makes no mention of Frye, and a rigid "general acceptance" requirement would be at odds with the "liberal thrust" of the Federal Rules and their "general approach of relaxing the traditional barriers to 'opinion' testimony." Beech Aircraft Corp. v. Rainey, 488 U.S., at 169 (citing Rules 701 to 705). See also Weinstein, Rule 702 of the Federal Rules of Evidence is Sound; It Should Not Be Amended, 138 F.R.D. 631, 631 (1991)("The Rules were designed to depend primarily upon lawyer-adversaries and sensible triers of fact to evaluate conflicts"). Given the Rules' permissive backdrop and their inclusion of a specific rule on expert testimony that does not mention "general acceptance," the assertion that the Rules somehow assimilated Frye is unconvincing. Frye made 'general acceptance' the exclusive test for admitting expert scientific testimony. That austere standard, absent from and incompatible with the Federal Rules of Evidence, should not be applied in federal trials.6

B

That the Frye test was displaced by the Rules of Evidence does not mean, however, that the Rules themselves place no limits on the admissibility of purportedly scientific evidence.7 Nor is the trial judge disabled from screening such evidence. To the contrary, under the Rules the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.

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6Because we hold that Frye has been superseded and base the discussion that follows on the content of the congressionally-enacted Federal Rules of Evidence, we do not address petitioners' argument that application of the Frye rule in this diversity case, as the application of a judge-made rule affecting substantive rights, would violate the doctrine of Erie R. Co. v. Tompkins, 304 U.S. 64 (1938).

7THE CHIEF JUSTICE "do[es] not doubt that Rule 702 confides to the judge some gatekeeping responsibility," post, at 4, but would neither say how it does so, nor explain what that role entails. We believe the better course is to note the nature and source of the duty.
The primary locus of this obligation is Rule 702, which clearly contemplates some degree of regulation of the subjects and theories about which an expert may testify. "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue" an expert "may testify thereto." The subject of an expert's testimony must be "scientific ... knowledge." The adjective "scientific" implies a grounding in the methods and procedures of science. Similarly, the word "knowledge" connotes more than subjective belief or unsupported speculation. The term "applies to any body of known facts or to any body of ideas inferred from such facts or accepted as truths on good grounds." Webster's Third New International Dictionary 1252 (1986). Of course, it would be unreasonable to conclude that the subject of scientific testimony must be "known" to a certainty; arguably, there are no certainties in science. See, e.g., Brief for Nicolaas Bloembergen et al. as Amici Curiae 2 ("Indeed, scientists do not assert that they know what is immutably 'true'--they are committed to searching for new, temporary theories to explain, as best they can, phenomena"); Brief for American Association for the Advancement of Science and the National Academy of Sciences as Amici Curiae 7-8 ("Science is not an encyclopedic body of knowledge about the universe. Instead, it represents a process for proposing and refining theoretical explanations about the world that are subject to further testing and refinement")(emphasis in original). But, in order to quality as "scientific knowledge," an inference or assertion must be derived by the scientific method. Proposed testimony must be supported by appropriate validation--i.e., "good grounds," based on what is known. In short, the requirement that an expert's testimony pertain to "scientific knowledge" establishes a standard of evidentiary reliability.9

Rule 702 further requires that the evidence or testimony "assist the trier of fact to understand the evidence or to determine a fact in issue." This condition goes primarily to relevance. "Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful." 3 Weinstein & Berger Para. 702[02], p. 701-18. See also United States v. Downing, 753 F.2d 1224, 1242 (CA 3 1985)("An additional consideration under Rule 702--and another aspect of relevancy--is whether expert testimony proffered in the case is sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute"). The consideration has been aptly described by Judge Becker as one of "fit." Ibid. "Fit" is not always obvious, and

8Rule 702 also applies to "technical, or other specialized knowledge." Our discussion is limited to the scientific context because that is the nature of the expertise offered here.

9We note that scientists typically distinguish between "validity" (does the principle support what it purports to show?) and "reliability" (does application of the principle produce consistent results?). See Black, A Unified theory of Scientific Evidence, 56 Ford. L. Rev. 595, 599 (1988). Although "the difference between accuracy, validity, and reliability may be such that each is distinct from the other by no more than a hen's kick," Starrs, Frye v. United States Restructured and Revitalized: A Proposal to Amend Federal Evidence Rule 702, 26 Jurimetrics J. 249, 256 (1986), our reference here is to evidentiary reliability--that is, trustworthiness. Cf., e.g., Advisory Committee's Notes on Fed. Rule Evid. 602 ("[T]he rule requiring that a witness who testifies to a fact which can be perceived by the senses must have had an opportunity to observe, and must have actually observed the fact' is a 'most pervasive manifestation' of the common law insistence upon 'the most reliable sources of information.'" (citation omitted); Advisory Committee's Notes on Art. VIII of the Rules of Evidence (hearsay exceptions will be recognized only "under circumstances supposed to furnish guarantees of trustworthiness"). In a case involving scientific evidence, evidentiary reliability will be based upon scientific validity.

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scientific validity for one purpose is not necessarily scientific validity for other, unrelated purposes. See Starrs, Frye v. United States Restructured and Revitalized: A Proposal to Amend Federal Evidence Rule 702, and 26 Jurimetrics J. 249, 258 (1986). The study of the phases of the moon, for example, may provide valid scientific "knowledge" about whether a certain night was dark, and if darkness is a fact in issue, the knowledge will assist the trier of fact. However (absent creditable grounds supporting a link), evidence that the moon was full on a certain night will not assist the trier of fact in determining whether an individual was unusually likely to have behaved irrationally on that night. Rule 702's "helpfulness" standard requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility.

That these requirements are embodied in Rule 702 is not surprising. Unlike an ordinary witness, see Rule 701, an expert is permitted wide latitude to offer opinions, including those that are not based on first-hand knowledge or observation. See Rules 702 and 703. Presumably, this realization of the usual requirement of first-hand knowledge--a rule which represents "a 'most pervasive manifestation' of the common law insistence upon 'the most reliable sources of information,'" Advisory Committee's Notes on Fed. Rule Evid. 602 (citation omitted)--is premised on an assumption that the expert's opinion will have a reliable basis in the knowledge and experience of his discipline.

C

Faced with a proffer of expert scientific testimony, then the trial judge must determine at the outset, pursuant to Rule 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue. We are confident that federal judges possess the capacity to undertake this review. Many factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test. But some general observations are appropriate.

Ordinarily, a key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been)

10Rule 104(a) provides:
"Preliminary questions concerning the qualification of a person to be a witness, the existence of a privilege, or the admissibility of evidence shall be determined by the court, subject to the provisions of subdivision (b)(pertaining to conditional admissions). In making its determination it is not bound by the rules of evidence except those with respect to privileges." These matters should be established by a preponderance of proof. See Bourjaily v. United States, 483 U.S. 171, 175-176 (1987).

11Although the Frye decision itself focused exclusively on "novel" scientific techniques, we do not read the requirements of Rule 702 to apply specially or exclusively to unconventional evidence. Of course, well-established propositions are less likely to be challenged than those that are novel, and they are more handily defended. Indeed, theories that are so firmly established as to have attained the status of scientific law, such as the laws of thermodynamics, properly are subject to judicial notice under Fed. Rule Evid. 201.
tested. "Scientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry." Green, at 645. See also C. Hempel, Philosophy of Natural Science 49 (1966)("[T]he statements constituting a scientific explanation must be capable of empirical test"); K. Popper, Conjectures and Refutations: The Growth of Scientific Knowledge 37 (5th ed. 1989)("[T]he criterion of the scientific status of a theory is its falsifiability, or refutability, or testability").

Another pertinent consideration is whether the theory or technique has been subjects to peer review and publication. Publication (which is but one element of peer review) is not a sine qua non of admissibility; it does not necessarily correlate with reliability, see S. Jasanoff, The Fifth Branch: Science Advisors as Policymakers 61-76 (1990), and in some instances well-grounded but innovative theories will not have been published, see Horrobin, The Philosophical Basis of Peer Review and the Suppression of Innovation, 263 J. Am. Med. Assn. 1438 (1990). Some propositions, moreover, are too particular, too new, or of too limited interest to be published. But submission to the scrutiny of the scientific community is a component of "good science," in part because it increases the likelihood that substantive flaws in methodology will be detected. See J. Ziman, Reliable Knowledge: An exploration of the Grounds for Belief in Science 130-133 (1978); Relman and Angell, How Good Is Peer Review?, 321 New Eng. J. Med. 827 (1989). The fact of publication (or lack thereof) in a peer-reviewed journal thus will be a relevant, though not dispositive, consideration in assessing the scientific validity of a particular technique or methodology on which an opinion is premised.

Additionally, in the case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error, see, e.g., United States v. Smith, 869 F.2d 348, 353-354 (Ca. 7 1989)(surveying studies of the error rate of spectrographic voice identification technique), and the existence and maintenance of standards controlling the technique's operation. See United States v. Williams, 583 F.2d 1194, 1198 (CA 2 1978)(noting professional organization's standard governing spectrographic analysis), cert. denied 439 U.S. 1117 (1979).

Finally, "general acceptance" can yet have a bearing on the inquiry. A "reliability assessment does not require, although it does permit, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within that community." United States v. Downing, 753 F.2d at 1238. See also 3 Weinstein & Berger Para. 702[03], pp. 702-41 to 702-42. Widespread acceptance can be an important factor in ruling particular evidence admissible, and "a known technique that has been able to attract only minimal support within the community," Downing, supra, at 1238, may properly be viewed with skepticism.

The inquiry envisioned by Rule 702 is, we emphasize, a flexible one. Its overarching

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12A number of authorities have presented variations on the reliability approach, each with its own slightly different set of factors. See, e.g., Downing, 753 F.2d 1238-1239 (on which our discussion draws in part); 3 Weinstein & Berger Para. 702[03], pp. 701-41 to 702-42 (on which the Downing court in turn partially relied); McCormick, Scientific Evidence: Defining a New Approach to Admissibility, 67 Iowa L. Rev. 879, 911-912 (1982):
subject is the scientific validity—and thus the evidentiary relevance and reliability—of the principles that underlie a proposed submission. The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate.

Throughout, a judge assessing a proffer of expert scientific testimony under Rule 702 should also be mindful of other applicable rules. Rule 703 provides that expert opinions based on otherwise inadmissible hearsay are to be admitted only if the facts or data are "of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject." Rule 706 allows the court at its discretion to procure the assistance of an expert of its own choosing. Finally, Rule 403 permits the exclusion of relevant evidence "if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury ..." Judge Weinstein has explained: "Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it. Because of this risk, the judge in weighing possible prejudice against probative force under Rule 403 of the present rules exercises more control over experts than over lay witnesses." Weinstein, 138 F.R.D., at 632.

We conclude by briefly addressing what appear to be two underlying concerns of the parties and amici in this case. Respondent expresses apprehension that abandonment of "general acceptance" as the exclusive requirement for admission will result in a "free-for-all" in which befuddled juries are confounded by absurd and irrational pseudoscientific assertions. In this regard respondent seems to us to be overly pessimistic about the capabilities of the jury, and of the adversary system generally. Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence. See Rock v. Arkansas, 483 U.S. 44, 61 (1987). Additionally, in the event the trial court concludes that the scintilla of evidence presented supporting a position is insufficient to allow a reasonable juror to conclude that the position more likely than not is true, the court remains free to direct a judgment, Fed. Rule Civ. Proc. 50 (a), and likewise to grant summary judgment, Fed. Rule Civ. Proc. 56. Cf., e.g., Turpin v. Merrell Dow Pharmaceuticals, Inc., 959 F.2d 1349 (CA 6)(holding that scientific evidence that provided foundation for expert testimony, viewed in the light most favorable to plaintiffs, was not sufficient to allow a jury to find it more probably than not than defendant caused plaintiff's injury), cert. denied, 506 U.S. ___ (1992); Brock v. Merrell Dow Pharmaceuticals, Inc., 874 F.2d 307 (CA 5 1989)(reversing judgment entered on jury verdict for plaintiffs because evidence regarding causation was insufficient), modified, 884 F.2d 166 (CA 5 1989), cert. denied, 494 U.S. 1046 (1990); Green 680-681. These conventional devices, rather than wholesale exclusion under an uncompromising "general acceptance" test, are the appropriate safeguards where the basis of scientific testimony meets the standards of Rule 702.

and Symposium on Science and the rules of Evidence, 99 F.R.D. 187, 231 (1983)(statement by Margaret Berger). To the extent that they focus on the reliability of evidence as ensured by the scientific validity of its underlying principles, all these versions may well have merit, although we express no opinion regarding any of their particular details.
Petitioners and, to a greater extent, their amici exhibit a different concern. They suggest that recognition of a screening role for the judge that allows for the exclusion of "invalid" evidence will sanction a stifling and repressive scientific orthodoxy and will be inimical to the search for truth. See, e.g., Brief for Ronald Bayer et al. as Amici Curiae. It is true that open debate is an essential part of both legal and scientific analyses. Yet there are important differences between the quest for truth in the courtroom and the quest for truth in the laboratory. Scientific conclusions are subject to perpetual revision. Law, on the other hand, must resolve disputes finally and quickly. The scientific project is advanced by broad and wideranging consideration of a multitude of hypotheses, for those that are incorrect will eventually be shown to be so, and that in itself is an advance. Conjectures that are probably wrong are of little use, however, in the project of reaching a quick, final, and binding legal judgment--often of great consequences--about a particular set of events in the past. We recognize that in practice, a gatekeeping role for the judge, not matter how flexible, inevitably on occasion will prevent the jury from learning of authentic insights and innovations. That, nevertheless, is the balance that is struck by Rules of Evidence designed not for the exhaustive search for cosmic understanding but for the particularized resolution of legal disputes.\(^{13}\)

IV

To summarize: "general acceptance" is not a necessary precondition to the admissibility of scientific evidence under the Federal Rules of Evidence, but the rules of Evidence--especially Rule 702--do assign to the trial judge the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand. Pertinent evidence based on scientifically valid principles will satisfy those demands.

The inquiries of the District Court and the Court of Appeals focused almost exclusively on "general acceptance," as gauged by publication and the decisions of other courts. Accordingly, the judgment of the Court of Appeals is vacated and the case is remanded for further proceedings consistent with this opinion.

It is so ordered.

CHIEF JUSTICE REHNQUIST, with whom JUSTICE STEVENS joins, concurring in part and dissenting in part.

The petition for certiorari in this case presents two questions: first, whether the rule of Frye v. United States, 54 Alp. D.C. 46, 293 F. 1013 (1923), remains good law after the enactment of the Federal Rules of Evidence; and second, if Frye remains valid, whether it requires expert scientific testimony to have been subjected to a peer-review process in order to

\(^{13}\)This is not to say that judicial interpretation, as opposed to adjudicative factfinding, does not share basic characteristics of the scientific endeavor: "The work of a judge is in one sense enduring and in another ephemeral. ... In the endless process of testing and retesting, there is a constant rejection of the dross and a constant retention of whatever is pure and sound and fine." B. Cardozo, The Nature of the Judicial Process 178, 179 (1921).
be admissible. The Court concludes, correctly in my view, that the *Frye* rule did not survive the enactment of the Federal Rules of Evidence, and I therefore join Parts I and II-A of its opinion. The second question presented in the petition for certiorari necessarily is mooted by this holding, but the Court nonetheless proceeds to construe Rules 702 and 703 very much in the abstract, and then offers some "general observations." Ante, at 12.

"General observations" by this Court customarily carry great weight with lower federal courts, but the ones offered here suffer from the flaw common to most such observations—they are not applied to deciding whether or not particular testimony was or was not admissible, and therefore they tend to be not only general, but vague and abstract. This is particularly unfortunate in a case such as this, where the ultimate legal question depends on an appreciation of one or more bodies of knowledge not judicially noticeable, and subject to different interpretations in the briefs of the parties and their amici. Twenty-two amicus briefs have been filed in the case, and indeed the Court's opinion contains no less than 37 citations to amicus briefs and other secondary sources.

The various briefs filed in this case are markedly different from typical briefs, in that large parts of them do not deal with decided cases or statutory language—the sort of material we customarily interpret. Instead, they deal with definitions of scientific knowledge, scientific method, scientific validity, and peer review—in short, matters far afield from the expertise of judges. This is not to say that such materials are not useful or even necessary in deciding how Rule 703 should be applied; but it is to say that the unusual subject matter should cause us to proceed with great caution in deciding more than we have to, because our reach can so easily exceed our grasp.

But even if it were desirable to make "general observations" not necessary to decide the questions presented, I cannot subscribe to some of the observations made by the Court. In Part II-B, the Court concludes that reliability and relevancy are the touchstones of the admissibility of expert testimony. Ante, at 9. Federal Rule of Evidence 402 provides, as the Court points out, that "[e]vidence which is not relevant is not admissible." But there is no similar reference in the Rule to "reliability." The Court constructs its argument by parsing the language "[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue ... an expert ... may testify thereto ..." Fed. Rule Evid. 702. It stresses that the subject of the expert's testimony must be "scientific ... knowledge," and points out that "scientific implies a grounding in the methods and procedures of science," and that the world "knowledge" connotes more than subjective belief or unsupported speculation." Ante, at 9. From this it concludes that "scientific knowledge" must be "derived by the scientific method." Ante, at 10. Proposed testimony, we are told, must be supported by "appropriate validation." Ante, at 10. Indeed, in footnote 9, the Court decides that "[i]n a case involving scientific evidence, evidentiary reliability will be based upon scientific validity." Ante, at 10, n. 9 (emphasis in original).

Questions arise simply from reading this part of the Court's opinion, and countless more questions will surely arise when hundreds of district judges try to apply its teaching to particular offers of expert testimony. Does all of this *dicta* apply to an expert seeking to testify on the
basis of "technical or other specialized knowledge"—the other types of expert knowledge to which Rule 702 applies—or are the "general observations" limited only to "scientific knowledge"? What is the difference between scientific knowledge and technical knowledge; does Rule 702 actually contemplate that the phrase "scientific, technical, or other specialized knowledge" be broken down into numerous subspecies of expertise, or did its authors simply pick general descriptive language covering the sort of expert testimony which courts have customarily received? The Court speaks of its confidence that federal judges can make a "preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." Ante, at 12. The Court then states that a "key question" to be answered in deciding whether something is "scientific knowledge" will be whether it can be (and has been) tested." Ante, at 12. Following this sentence are three quotations from treatises, which speak not only of empirical testing, but one of which states that "the criterion of the scientific status of a theory is its falsifiability, or refutability, or testability," ante, pp. 12-13.

I defer to no one in my confidence in federal judges; but I am at a loss to know what is meant when it is said that the scientific status of a theory depends on its "falsifiability", and I suspect some of them will be, too.

I do not doubt that Rule 702 confides to the judge some gatekeeping responsibility in deciding questions of the admissibility of proffered expert testimony. But I do not think it imposes on them either the obligation or the authority to become amateur scientists in order to perform that role. I think the Court would be far better advised in this case to decide only the questions presented, and to leave the further development of this important area of the law to future cases.

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