UNITED STATES OF AMERICA
BEFORE THE NATIONAL LABOR RELATIONS BOARD

DANA CORPORATION
Employer
and
CLARENCE K. ATHERHOLT
Petitioner
and
INTERNATIONAL UNION, UNITED AUTOMOBILE, AEROSPACE AND AGRICULTURAL IMPLEMENT WORKERS OF AMERICA, AFL-CIO
Union

Case 8-RD-1976

METALDYNE CORPORATION (METALDYNE SINTERED PRODUCTS)
Employer
and
ALAN P. KRUG AND JEFFREY A. SAMPLE
Petitioners
and

Cases 6-RD-1518
6-RD-1519

INTERNATIONAL UNION, UNITED AUTOMOBILE, AEROSPACE AND AGRICULTURAL IMPLEMENT WORKERS OF AMERICA, AFL-CIO
Union

341 NLRB No. 150

BRIEF FOR THE TENNESSEE CHAMBER OF COMMERCE AND INDUSTRY AS AMICUS CURIAE SUPPORTING PETITIONERS

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Pursuant to the Board's Notice and Invitation to File Briefs, the following is submitted as the Brief for the Tennessee Chamber of Commerce and Industry As Amicus Curiae Supporting Petitioners.

I. INTEREST OF THE AMICUS CURIAE

The Tennessee Chamber of Commerce & Industry is the largest organization in the State of Tennessee engaged in representing business and industry. It represents more than 1,000 member companies in Tennessee. As a trade association representing the interest of employers, the Tennessee Chamber is concerned with protecting the rights of those individuals whom its member companies employ. The right of employees to choose third party representation through a secret ballot election is one of paramount importance to employers across Tennessee as they seek to preserve that basic fundamental right of employees to hear all sides of an issue and vote with complete confidentiality. A card check based on neutrality denies employees that basic right. Accordingly, the Tennessee Chamber submits that the removal of the recognition bar following voluntary recognition of a union would serve to advance employee rights under Section 7 of the Act. The Tennessee Chamber submits that, in the alternative, the Board should permit the processing of a decertification petition filed within 45 days of any voluntary recognition granted.

II. STATEMENT OF THE CASES

On June 7, 2004, the Board issued its Order Granting Review in the subject cases[1] with a Board majority granting Petitioners' Request for Review of the Regional Directors' administrative dismissals of the petitions in the instant cases "as they raise

[1] 341 NLRB No.150 (June 7, 2004)

substantial issues regarding whether the Employers' voluntary recognition of the Union bars a decertification petition for a reasonable period of time under the circumstances of these cases." The Board majority[2] noted: "[I]n both of the instant cases an agreement was reached between the union and the employer before authorization cards evidencing the majority status were obtained. In addition, we believe that changing conditions in the labor relations environment can sometimes warrant a renewed scrutiny of extant doctrine." The Board majority stated that "we believe the increased usage of recognition agreements, the varying contexts in which a recognition agreement can be reached, the superiority of Board supervised secret ballot elections and the importance of Section 7 rights of employees are factors which warrant a critical look at the issues raised herein..."

In reaching its conclusion that review was warranted, the majority stated:

> Neither MGM, nor Seattle Mariners, 335 NLRB 563 (2001), cited by our colleagues, deals with the issue presented here. Both cases assume the very proposition that is at issue here, viz., whether voluntary recognition of the kind involved herein should give rise to a recognition bar. More specifically, MGM, supra, assumes the recognition bar principle, and then deals with the issue of whether a 30-percent antiunion petition at the time of recognition would preclude the recognition from being used as a bar. Thus, neither case raises the threshold issue of whether the recognition should be a bar in the first place where, as here, it follows a card-check agreement that was entered into when the union had no majority support.
>
> Our colleagues, citing the Board's Rules and Regulations, Section 102.67(c), say that there are no compelling reasons for a grant of review. Fortunately, the section sets forth what a "compelling reason" can be. One of them is "a need for reconsideration of an important rule or policy." Precisely that situation exists here.

[2] The majority consisted of Chairman Robert J. Battista and Members Peter C. Schaumber and Ronald Meisburg.

III. STATEMENT OF THE FACTS[3]

In the matter of Dana Corporation, Case 8-RD-1976, the Employer (herein "Dana") and the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America, AFL-CIO (herein "UAW" or "Union"), on August 6, 2003, entered into a neutrality/card check agreement which provided, inter alia, for Dana to recognize the Union as the bargaining representative of an agreed-upon unit of Dana employees if the Union could demonstrate, through a card check, that the Union had been authorized by a majority of unit employees to represent the unit for purposes of collective-bargaining. At the time that Dana and the Union entered into the agreement, the Union had not obtained authorization cards evidencing majority status.

On or about November 26, 2003, following an extended and, apparently intense, card-solicitation campaign, the Union notified Dana that it had the support of a majority of the employees employed in the unit. On December 4, 2003, after a card check by a neutral third party, Dana voluntarily recognized the Union. On January 7, 2004, a Dana employee filed a petition for a decertification election.

In the matter of Metaldyne Corporation (Metaldyne Sintered Products), Cases 6-RD-1518 and 6-RD-1519, Metaldyne Corporation (herein "Metaldyne"), in September 2002, entered into a neutrality/card-check agreement with the Union which, like the agreement in the Dana case, provided for a grant of recognition to the Union if the Union could subsequently demonstrate that it had secured a valid card majority.

Thereafter, the Union conducted an organizing campaign among Metaldyne employees employed in an agreed-upon production and maintenance unit at Metaldyne's

[3] From the Board's Slip Opinion at 341 NLRB No. 150 (June 7, 2004), the Dismissal Letter of the Regional Director of Region 6 of the Board in Metaldyne Corporation and the Dismissal Letter of the Regional Director of Region 8 of the Board in Dana Corp.

facility at St. Mary's, Pennsylvania. Some 14 months later, on November 26, 2003, the Union notified Metaldyne that it had the support of a majority of the employees employed in the unit. On December 1, 2003, following a card check by a mediator employed by the Federal Mediation and Conciliation Service, Metaldyne granted recognition to the Union. Thereafter, on December 23, 2003, employees filed two decertification petitions.

As in the Dana case, the Union did not have the support of a majority of unit employees at the time that the parties entered into their neutrality and card check agreement in September 2002.

IV. HOLDINGS OF THE REGIONAL DIRECTORS

In an underlying decision, the Regional Director of Region 6 of the Board dismissed the two petitions in the Metaldyne cases, holding that voluntary recognition of a union in good faith based on demonstrated majority status will bar a decertification petition for a reasonable period of time, citing Keller Plastics Eastern, Inc., 157 NLRB 583 (1966), Sound Contractors Assn., 162 NLRB 143 (1966) and Rockwell International Corp., 220 NLRB 1262 (1975).[4]

In Keller Plastics, an unfair labor practice case, the Board held that where bargaining status is established through good faith voluntary recognition of a union which has demonstrated majority support, the parties are permitted a reasonable period to bargain without challenge to the union's status. This doctrine was applied in a representation case in Sound Contractors and was held to bar a decertification petition in Rockwell.

[4] The underlying doctrine of 'recognition bar' established 38 years ago did not present, as do the cases herein, the application of the doctrine to neutrality/card check agreements.

Within his dismissal letter, the Regional Director stated, in part, as follows:

> In these cases, the Petitioners urge the creation of an exception to the election bar doctrine which would allow the filing of a decertification petition within a 30-day window after an employer recognizes a union based on a card check. The Petitioners argue that such an exception promotes employee free choice because an election is conducted under "laboratory conditions" while authorization cards may be signed as a result of coercion or misrepresentations. Further, Petitioners argue that such an exception will not impair industrial stability because employees will have confidence in the results of a Board-conducted election. Finally, the Petitioners argue that such an exception ensures that the NLRB is the arbiter of majority status rather than a third party conducting a card check.
>
> While urging the creation of an exception to the recognition bar doctrine to allow a decertification petition filed within 30 days of the grant of recognition, the Petitioners do not challenge the validity of the initial grant of recognition herein. That is, while the Petitioners suggest that the possibility of coercion and misrepresentation attendant to card signing provides a rationale for the creation of an exception to the recognition bar doctrine, the Petitioners do not argue that the Employer could not invoke the recognition bar doctrine under Keller Plastics.
>
> . . .
>
> Nearly 30 years ago, the Board rejected an attempt to file a decertification petition within 30 days of a grant of recognition. In Rockwell International Corp., 220 NLRB 1262, 1263 (1975), the Board dismissed a decertification petition as untimely following voluntary recognition. In that case, a neutral third party certified that the union possessed majority status based upon a card check. A decertification petition was filed 14 days later and the petition was supported by over 50 percent of the unit employees. The petitioner asserted that the employees were led to believe that they would have the right to vote and that the employer's voluntary recognition based on a card check denied them this right. The Board held that "[f]ollowing a lawful grant of recognition the parties are entitled to a reasonable period of time to permit them to

> attempt to negotiate a collective-bargaining agreement; during that period a decertification petition is not timely."

(citations omitted).

The Petition in the Dana case likewise was dismissed by the Regional Director of Region 8 of the Board based upon his conclusion that Dana's voluntary recognition of the UAW barred a decertification petition for a reasonable period of time. In support of his dismissal of the petition, the Regional Director of Region 8 cited Keller Plastics Eastern, supra, and MGM Grand Hotel, 1999 WL 80517, *1 (NLRB Sept. 30, 1999).

V. ARGUMENT

A. The Recognition Bar Policy Should Be Removed Or, In The Alternative, Modified To Permit The Processing Of Decertification Petitions Filed Within 45 Days of Recognition

The imposition of the recognition bar policy has resulted in employees being denied timely access to the "preferred" means of expressing their views on union representation, i.e., a secret ballot election conducted by a Board agent under established "laboratory conditions." Thus, employees have no means of contesting, within a reasonable period of time, representation accomplished through a "*non-preferred*" method of gauging employee sentiment.

The use of authorization cards to achieve majority status, while sanctioned by the Supreme Court in NLRB v. Gissel Packing Co., 395 U.S. 575 (1969), has resulted in contentious litigation over signature authentication, claims of misrepresentation, allegations of unlawful employer assistance, claims that employers have allowed unions to coerce employees into signing cards, claims of forged signatures, claims of improper card counts and incorrect results. The use of the secret ballot election, meanwhile, is designed to assure an outcome in keeping with the true sentiments of employees.

Clearly, the rights of employees under the statute can be better protected through elections and all parties can feel more confident that a correct result has been achieved.

As Board Member Brame observed in MGM Grand, supra:

> Voluntary recognition is fundamentally different from a "solemn" election conducted under "laboratory conditions." A Board election and Board certification that follow occupy a special place in Board law:
>
> "There is no doubt but that an election . . . conducted secretly . . . after the employees have had the opportunity for thoughtful consideration, provides a more reliable basis for determining employee sentiment than an informal card designation procedure where group pressures may induce an otherwise recalcitrant employee to go along with his fellow workers."

MGM Grand, 1999 WL 801517 at *12 (Member Brame dissenting) (citing NLRB v. Cayuga Crushed Stone, 474 F.2d 1380, 1383).

B. New Evidence Conclusively Establishes That Card Checks By Laypersons Are Wholly Unreliable And May Lead To Recognition Of A Minority Union

Under a neutrality/card check agreement, the parties typically rely upon the results of an informal card check conducted by a neutral third party—most often a layperson. Until recently, there has been a scarcity of data which compared the performance of professional forensic document examiners to the performance of laypersons in document examination tasks. However, evidence now exists that signature comparisons by laypersons are inherently unreliable in determining the authenticity of signatures, thereby rendering laypersons as totally unfit to render certifications of card majorities and risk imposing unions on employees not of their choosing. Thus, a landmark study published in July 2001 by the American Academy of Forensic Sciences in the Academy's Journal of Forensic Sciences established conclusively that the error rate

for lay examiners far exceeds the error rate for forensic document examiners. The specific findings revealed the following conclusions:

> [E]rror rates of the FDEs (Forensic Document Examiners) were much lower than those of the laypersons. These results point to the superiority of FDEs over laypersons in determination of genuineness of signatures and in detection of simulations.

Signature Authentication by Forensic Document Examiners by Moshe Kam, Ph.D; Kishmore Gummadidala, M.S.; Gabriel Fielding, Ph.D and Robert Conn, Ph.D, published in the Journal of Forensic Sciences, Volume 46, Number 4, July 2001 at page 888.[5]

The significance of this landmark study to the instant cases is glaringly evident from one of the major findings of the study:

> Using standard statistical tests, the hypothesis that there is no difference between the assessments provided by FDEs and laypersons about genuineness and nongenuineness of signatures was rejected. We found significant statistical differences between the data generated by FDEs and by laypersons. The laypersons wrongly classified nongenuine signatures as genuine 13 times more often than FDEs . . .

Id. at pp. 884-885 (emphases supplied).

The error rate of laypersons over forensic examiners reflected in the study occurred notwithstanding the fact that, in their examination of signatures in the conduct of the study, the laypersons were permitted to use hand-held magnifiers, a light source, and microscopes of the kind used in regular forensic document examination practice. Unlike the "safeguards" present in the controlled study, it is extremely unlikely that neutral third parties, i.e., laypersons, with any regularity, use such equipment in conducting card checks pursuant to neutrality agreements. Therefore, the error rate would

[5] Attached as Exhibit "A." Request is hereby made for the Board to take official notice of this landmark study.

be expected to be even greater absent the necessary controls to insure the reliability of signature comparisons.[6]

The results of two other later studies published in the Journal of Forensic Sciences further confirmed that handwriting examinations conducted by laypersons are wholly unreliable.

Thus, a study funded by Drexel University's Distinguished Professor Award and the National Institute of Justice Award showed that forensic document examiners substantially outperformed laypersons in all forms of handwriting tested—hand-printed, non-hand-printed, cursive and non-cursive. The results which were published in the November 2003 issue of the Academy's Journal of Forensic Sciences showed that the error rate among laypersons substantially exceeded the rate for forensic documents examiner. Kam, Writer Identification Using Hand-Printed and Non-Hand-Printed Questioned Documents, Journal of Forensic Sciences, Vol.48, No. 6 (November 2003).[7]

A separate study dealing specifically with signature comparison showed an error rate of 19.3 percent among laypersons compared to an error rate among forensic handwriting examiners of only 3.4 percent. The authors concluded that forensic document examiners possess a level of expertise that is "significantly superior to that of the control group of average, well-educated people." Sita, Found and Rogers, Forensic

[6] Moreover, employers are effectively precluded from attempting to verify the accuracy of a neutral layperson's findings. For example, if an employer questions an employee concerning whether he did or did not sign a card presented by a union as part of a card check, he risks engaging in conduct violative of the Act. An employer runs similar risks if it attempts to verify whether a card signature was obtained as a result of material misrepresentations made to card signers in order to induce them to sign.

[7] Request is hereby made for the Board to take official notice of this new evidence.

Handwriting Examiners' Expertise for Signature Comparison, Journal of Forensic Sciences, Vol. 47, No. 5, p. 5 (September 2002).[8]

Given that the neutrality/card check arrangements do not require the utilization of a forensic examiner but rather permit the use of any neutral layperson, the examination of authorization cards is inherently flawed and a layperson's "certification" of majority status is wholly unreliable and raises the real risk that fraudulent cards will not be uncovered. This is especially true where there are no safeguards to assist a layperson's document examination such as affidavits from employees or witnesses certifying that the signatures are genuine.

While laypersons may be well-intentioned, they are no substitutes for an examination of documents in question—authorization cards and exemplars—by forensic document examiners and their certification that, in their professional opinion, the signatures appearing on the cards and the exemplars belong to the purported signers.

In light of these forensic studies, the Board has a new body of evidence to consider as it revisits the recognition bar issue. The Board can no longer, in the face of this new evidence presented in these studies, permit a card check by a layperson to constitute the final word on the issue of union representation, but should apply, as a minimum safeguard, the Board's election processes sought by the Petitioners herein.

The Board majority is rightfully concerned that recognition based upon an unreliable card check can result in an erroneous finding of a card majority and, in turn, result in recognition of a minority union and impose on employees a union not of their own choosing. Now that this new body of evidence is before the Board, were the Board not to remove the bar to the filing of decertification petitions in circumstances presented

[8] Request is hereby made for the Board to take official notice of this new evidence.

herein, the Board would knowingly jeopardize the Section 7 rights of employees. Surely, the Board does not wish to be viewed as an agency that adheres to an outdated policy that contributes to the non-adherence of the very laws that it is sworn to uphold.

The dangers inherent in permitting unions to gain recognition without majority support were emphasized by the Second Circuit in Royal Coach Lines, Inc. v. NLRB, 838 F.2d 47 (2d Cir. 1988), where the court noted:

> The problems surrounding employer recognition of unions that enjoy less than majority support were discussed by the Supreme Court in International Ladies' Garment Workers' Union v. NLRB (Bernard-Altman Texas Corp.), 366 U.S. 731, 81 S.Ct. 1603, 6 L.Ed.2d 762 (1961). The Court, in Bernard Altman, considered whether such recognition is an unfair labor practice by the employer, in violation of Section 8(a)(2) of the Act. The discussion in Bernard-Altman is illuminating with respect to fundamental policies underlying the Act. In concluding that recognition of a minority union is indeed a violation of the Act, the Court noted that one of the primary dangers of such a practice is that the union could use the recognition as "a deceptive cloak of authority with which to persuasively elicit additional employee support." Id. at 736, 81 S.Ct. at 1607. Anointing a minority of workers with such authority is a clear abridgement of Section 7 of the Act, assuring employees the right 'to bargain collectively through representatives of their own choosing' or 'to refrain from' such activity." *Id.* at 737, 81 S.Ct. at 1607 (quoting from Section 7, 29 U.S.C. Section 157 (1982). See also NLRB v. Local Union No. 103, Int'l Ass'n of Bridge, Structural & Ornamental Iron Workers, 434 U.S. 335, 344-45, 98 S. Ct. 651, 657-58, 54 L.Ed. 2d 586 (1978). Moreover, as the Supreme Court also made clear in Bernard-Altman, recognition improperly founded on minority support cannot be ratified by a subsequent showing of majority support. If the agreement is, in the first instance, "obtained under an erroneous claim of majority representation . . . [,] the unlawful genesis of th[e] agreement precludes its [subsequent] validity." Bernard-Altman, 366 U.S. at 737, 81 S.Ct. at 1607. See also R.J.E. Leasing Corp., 262 NLRB 373, 380 (1982) (noting in a Section 8(a)(2) case that the invalidity of a recognition agreement initially

> founded on minority support "taints" any subsequent and otherwise valid collective bargaining agreements between the union and the employer.)

Id. at 50-51.

In light of the foregoing, the need for an election to determine if bargaining should proceed unquestionably outweighs concerns over disruption of bargaining that may occur following a card check. By rigidly applying the recognition bar doctrine to a card check conducted pursuant to a neutrality and card check agreement the Board unnecessarily tips the scales against the election process. To bring greater balance to the Board's representation procedures, the Board should now eliminate the recognition bar policy in its entirety or, alternatively, it should revise the policy adopted in Keller Plastics and allow a decertification petition filed within 45 days of recognition to be processed. The Keller Plastics doctrine is an anachronism since it did not encompass a neutrality agreement which is paramount in the instant cases. The time has come for the Board to grant employees the opportunity to take advantage of a secret ballot election - - one of "the 'crown jewels' of this nation's practice of industrial democracy." S.F.D.H. Associates, L.P., 330 NLRB 638 (2000).

The time required to permit employees to use the Board's election processes clearly is not an "imposition" upon employers and labor organizations. Rather, it is a basic safeguard against the dangers of reaching an unjust result in card-based recognition.

As former Chairman Hurtgen emphasized in MGM Grand Hotel, Inc., 1999 WL 801517, *1, *8 (NLRB Sept. 30, 1999) (Chairman Hurtgen dissenting) action favoring employers and unions in their efforts to reach a contract represents "a policy choice" while "protecting the Section 7 rights of employees to reject or retain the union as their

representative" is "*expressly in the Act and indeed lies at the heart of the Act.*" Id. (emphasis supplied). For too long, the representation bar policy of the Board has given employers and unions excessive power at the expense of employee free choice.[9]

C. Employees Are Not Protected By The 'Laboratory Conditions' Established By The Board In Its Elections When Representation Is Determined By Neutrality/Card Check Agreements

The Board, in Underground Service Alert of Southern California, 315 NLRB 958 (1994) quoted with approval the following observation by Member Oviatt:

> The election, typically, also is a more reliable indicator of employee wishes because employees have time to consider their options, to ascertain critical facts and to hear and discuss their own and competing views....

Id. at 960 (quoting W.A. Krueger Co., 299 NLRB 914 (1990)(Member Oviatt dissenting).

Employees are deprived, however, of hearing both sides of an issue where neutrality/card check arrangements are in effect and, therefore, are unable to "ascertain critical facts" and hear "competing views." Thus, in card solicitation campaigns conducted pursuant to a neutrality agreement, employees routinely cannot be informed of the disadvantages of unionization because employers have effectively waived their right under Section 8(c) of the Act to inform employees of the disadvantages of unionization. The fact that only 9.5 percent of all employees in private industry are in unions today is a reality and employees are entitled to learn about the underlying reasons causing less than 1 out of 10 employees to be union members today.

In addition, the basic statutory protections to employees provided in Section 7 of the Act are at risk as a result of neutrality agreements. For example, too often unions in card solicitations emphasize that under Section 7 of the Act, employees have a protected

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[9] See General Shoe Corp., 77 NLRB 124 (1948).

right to join or support a union. Without hearing from the employer on the entirety of Section 7,[10] solicited employees may not be aware that a basic protection of Section 7 provides that employees also have the right to refrain from choosing or selecting a union. In short, not only do neutrality agreements have the effect of denying employees the right to be fully and honestly informed about both the disadvantages and advantages of union representation, such agreements can also deny employees an awareness of the basic protections of Section 7. Employees who sign cards under these circumstances are not signing them under the "laboratory conditions" which the Board provides as part of the election process.

Providing employees with the opportunity to cast secret ballots in NLRB supervised elections only after hearing all of the critical facts and having a period of reflective opportunity to investigate both sides is a fundamental mandate the Board must exercise in order to effectuate the policies of the Act.

D. Additional Factors Favor Modification Of The Representation Bar Policy

Neutrality agreements often involve trade-offs that benefit unions and employers but rarely, if ever, provide added benefits for employees. In explaining how unions obtain neutrality agreements, Professor Roger C. Hartley, writing in the Berkeley Journal of Employment and Labor Law, observes:

> Normally unions trade for them. What a union can offer depends on many factors, such as whether some of the employers' operations are already organized, whether an employer needs to resolve certain legal conflicts with a

[10] Section 7 of the Act provides: "Employees shall have the right to self-organization, to form, join or assist labor organizations, to bargain collectively through representatives of their own choosing and to engage in other concerted activities for the purpose of collective bargaining or other mutual aid or protection and shall also have the right to refrain from any or all such activities . . ." (emphasis supplied).

> union and whether an employer is vulnerable to the vagaries of governmental regulation and in need of the union's assistance in winning beneficial regulatory rulings. One of the most important ways a union secures a neutrality agreement is when a state or local government requires one from a private sector employer with whom it does business. In addition, unions sometimes are able to leverage their own financial power by investing union funds only with corporations that agree to enter into neutrality agreements.

Hartley, Non-Legislative Labor Law Reform and Pre-Recognition Labor Neutrality Agreements: The New Civil Rights Movement, 22 Berkeley J. Emp. & Lab. L. 369 (2000).

Continuing, Professor Hartley notes:

> Increasingly, to secure labor peace, some local jurisdictions have decided to require a neutrality agreement from any private investor seeking access to public land or financing. A typical example is a real estate developer bidding to build a public works project. Often the developer will own and manage a hotel, for example, that is built on public land, or financed in part through tax abatements, public loans or other forms of public financing.
>
> Unions also are beginning to realize the organizing potential of their own financial power. The AFL-CIO has created "a new corporate affairs department that is 'teaching unions how to use their financial power to bring anti-union employers in line.'"
>
> Unions can use considerable economic power as consumers and use that power to assist in securing neutrality agreements. Union conventions and meetings, for example, represent a large, and lucrative, business for hotels and convention centers. In San Diego, the convention center is undergoing a major renovation and there is considerable redevelopment of downtown San Diego in the vicinity of the convention center. In the spring of 2000, the Convention Center Corporation's Board of Directors passed a resolution that requested hotel developers and owners of existing hotels to discuss "the adoption of labor neutrality agreements." . . . As an added inducement to persuade local businesses in San Diego's hospitality industry to sign neutrality agreements, John Wilhelm,

> President of HERE "promised that his union would take an active role in helping to steer union business to San Diego if neutrality agreements were forthcoming."
>
> Union health and welfare funds can be used effectively to help barter neutrality agreements . . . In what has been referred to as "one of the largest labor management partnerships ever" the AFL-CIO and Kaiser Permanente agreed to an arrangement that requires Kaiser Permanente to place employees and their unions in corporate policy-making positions and provides a pledge that the company will both remain neutral in any organizing drives among the non-union employees and recognize the union upon its gaining majority support. In return, the AFL-CIO has committed itself to "steer union members to the health maintenance organization as a health care plan of choice [and] work with [the union's] Taft-Hartley [health and welfare] funds to include Kaiser as an option."
>
> Finally, union pension funds are major potential real estate investors. Because the capital markets currently are wary of hotel investments, union pension funds have become a welcome alternative source of funding for real estate investments . . . Through such real estate investments, unions have been able to leverage neutrality agreements.

Id. at 394-95.

While unions are benefiting in a variety of ways from neutrality agreements, employees are being deprived of the important statutory right to choose for themselves whether they desire union representation. In order to protect this right in the face of powerful union-management resources and bargaining leverage, the Board should grant employees access to the ballot box. By doing nothing, the Board allows forced unionism to flourish and sanctions "non-legislative labor law reform".

Meanwhile, non-union employers who are not willing to forego their right to express their views under Section 8(c) of the Act or to simply exercise their right to

lawfully resist unionization are forced to withstand the pressures described by Professor Hartley and to suffer the consequences of their resistance.

In the period of time that the representation bar policy has been in effect, the Board has been faced with numerous issues involving the use of neutrality agreements. In his article entitled "Neutrality Agreements: Basic Principles of Enforcement and Available Remedies" in the Fall 2000 edition of The Labor Lawyer, Attorney George N. Davies noted some of these as follows:

> While neutrality agreements take many forms and often contain a wide variety of clauses, a typical agreement requires that an employer remain neutral during the union's organizing campaign, waive its right to a Board conducted election, and agree to a set of procedures governing the parties' conduct during the organizing drive. Usually, these provisions take the form of controlled access by the union to the employees to deliver its message, an employer statement that it does not object to its employees choosing union representation, and a voluntary recognition of the union by the employer upon a showing of an authorization card majority. Of course, the details contained in these provisions, which are the source of each of the parties' rights and obligations, are often complex and informed by mutual understandings of the parties, particularly in complicated and longstanding collective bargaining relationships.
>
> The negotiation and implementation of neutrality agreements raise a myriad of legal and practical issues. These issues range from the mandatory-permissive subject of bargaining dichotomy and whether the clauses themselves violate section 8(e) of the National Labor Relations Act (NLRA), to the enforcement of and remedies available when these agreements are breached.

16 The Labor Lawyer 215, 215-16 (2000).

Also an open question is whether employers may escape the proscription of Section 8(a)(2) of the Act by granting a particular union the exclusive right to organize its

employees when there is no other union on the scene. While such an agreement clearly deprives employees of the opportunity to select a union of "their choosing", many neutrality agreements, including the agreements involved in the subject cases, either explicitly or implicitly, grant unions such a right. Indeed, agreeing to a neutrality agreement in advance of a card check gives one union, in many cases selected by the employer, "preferred" status.

While employers and unions are admittedly free to work through the kinds of issues described by Attorney Davies, employees should nevertheless be afforded the opportunity to decide at an early point in time whether voluntary recognition should give way to a choice to have 'no union' or another union.

Contrary to the views expressed by the Board's minority in the instant cases, employers and unions should welcome a test of their agreements before they have expended time and effort bargaining toward an initial contract. If such a test had been available to employees of the MGM Grand at the time that the Company granted recognition to the Union, neither the employees nor the parties would have had to wait from November 15, 1996 (the date on which the Company recognized the Union) until September 30, 1999 (the date of the Board's decision in MGM Grand) to learn the outcome. Indeed, when one considers the length of time required for the MGM Grand case to run to conclusion, the time ordinarily consumed to process a decertification petition appears to be minimal.

The dissent argues that the parties to neutrality agreements should not be interrupted in their efforts to reach agreement on a contract. It could just as forcefully be argued that the Board's recognition bar policy, by embracing the concept of giving the

parties a "reasonable period of time," as that term was defined in MGM Grand, encourages one party or the other to delay proceedings as long as possible and, thereby, indefinitely deny employees an opportunity to express their sentiments through the election process.

The delay not only prevents employees from voting on the question of whether they should or should not be represented, but denies them an opportunity to select another labor organization, one that they may feel would better represent their interests. Many employees may, after more than 11 months of unsuccessful bargaining, as in the MGM Grand case, have become dissatisfied with the performance of the union and may have become anxious to choose another union to represent them. In such circumstances, employees may feel that the Act's guarantee of the right to "select a union of their choosing," is a hollow phrase, one that the Board abandoned in the name of "no disruption."

It has not been demonstrated that the holding of a decertification election shortly after a grant of voluntary recognition would unduly interfere with the progress of bargaining. In this regard, the parties (assuming that they have begun bargaining) would be deemed to be obligated to bargain in good faith pending the outcome of the election. In the event employees vote in favor of continued representation by the recognized union, they would simply continue to negotiate for an initial agreement. If, on the other hand, employees reject representation, the parties will simply be left where they stood at the time that they entered into their neutrality/card check agreement.

It is no mystery why unions go to great lengths to persuade employers to enter into neutrality agreements that provide for card check recognition. In a review and

commentary of Paul C. Weiler's book Wither Goest Labor Law: Law and Economics in the Workplace, the reviewer noted as follows:

> Roughly 40 percent of the employees whose workplaces are subject to an NLRB election wind up with a union certified as collective bargaining representative, but unions obtain collective bargaining agreements following certification in only half the cases. It bears emphasizing that the workplaces where NLRB elections are conducted are those chosen by the unions for organizing and in which 30 percent of the employees signed union authorization cards (the minimum showing of interest necessary to secure an NLRB election).

Michael H. Gottesman, Review of Wither Goest Labor Law: Law and Economics in the Workplace by Paul C. Weiler, 100 Yale L.J. 2767, 2800, f. 138, 1991.

With statistics such as those described by reviewer Michael H. Gottesman, it is understandable why unions want to take advantage of the Board's recognition bar "loophole" in an effort to gain Board certification and to get a head start toward a first contract. From the standpoint of organized labor it simply makes 'good business sense.' As former Board Member Charles I. Cohen explained in his article Neutrality Agreements: Will the NLRB Sanction Its Own Obsolescence?, 16 The Labor Lawyer 201, 202 (2000):

> The advantage to unions in obtaining neutrality agreements is apparent: They assist unions in increasing membership without the need for the lengthy, expensive and ultimately unpredictable process of the NLRB. Sophisticated neutrality agreements ease organizing at the signatory employer's corporate affiliates and business partners, which furthers union objectives to bind affiliated companies to union contracts as a substitute for traditional union organizing and bargaining.

The interests of organized labor are being served at the expense of employee free choice. Those seeking decertification elections in the subject cases recognize this and are

urging the Board to, in effect, close the "loophole" created by the Board's current recognition bar policy. Clearly, the will of employees as expressed through secret-ballot elections should "trump" neutrality/card check agreements. In order to remedy a situation that constitutes an unwarranted infringement on the Section 7 rights of employees, the Board should now either eliminate the recognition bar policy in its entirety or create an exception to the policy which provides for the early processing of a decertification petition.

E. It Is Particularly Appropriate To Remove The Recognition Bar Where A Union Does Not Have Majority Status At The Time It Enters Into A Neutrality Agreement

It is contended that there is something inherently wrong with procedures that allow unions to circumvent Board-conducted elections—the long-favored method of determining employee sentiment—in favor of a method where election safeguards are absent. This is especially true where a union demands that an employer enter into a neutrality/card check agreement at a point in time when the union lacks majority support.

As suggested by former Board Member William B. Cowen in his dissent in Brylane LP, 2002 WL 31674875, *1 (NLRB Nov. 20, 2002), the demand for a neutrality agreement or outright recognition at a time when the union does not, in fact, have the support of a majority may be "unlawful" under the statute. In his dissent, Member Cowen observed as follows:

> As an additional matter, I note that the Union here does not actually claim to be the majority representative of the Employer's employees. Under these circumstances, the Union's demand is actually a demand for recognition in the absence of majority status, and, as such, is unlawful. Clearly, the Union has sought an agreement with the Employer regarding the Employer's employees and it is equally clear that the Union is not currently the

> representative of those employees under Section 9(a) of the Act. Since only a 9(a) representative may lawfully deal with an employer concerning wages, hours or other terms and conditions of employment, the Union's request for such dealing is unlawful.
>
> Finally, since a neutrality/card check agreement is a "thing of value" to the Union, and no exception appears to apply, its request for a neutrality/card check agreement also appears to be unlawful under Section 302 of the Labor Management Reporting and Disclosure Act, 29 USC 186.

Id. at *3 (Member Cowen dissenting).

The General Counsel of the Board has recognized that a demand for a neutrality agreement is tantamount to a demand for recognition. Thus, in an Advice Memorandum issued on June 11, 2003, in the matter of International Union of Operating Engineers, Local 17 (Zoladz Construction Company, Inc.), Case 3-CP-398, the General Counsel authorized the issuance of a complaint alleging that a union had violated Section 8(b)(7)(C) of the Act by picketing in excess of 30 days with an object of obtaining a signed neutrality/card check agreement from an employer. There, the General Counsel concluded that since the "ultimate goal" of the neutrality/card check agreement was to secure recognition of the union, the union's picketing "encompassed both an organizational and recognitional object." See also The Wackenhut Corp., 287 NLRB 374 (1987), where the Board found it unlawful for a union to threaten to picket an employer unless the employer acceded to the union's demand for card-check recognition or a non-Board election.

When the General Counsel's position is linked with the conclusions of former Board Member Cowen, a strong argument can be made that the actions of the UAW in requesting a neutrality/card agreement when it did not hold majority status constitutes an

outright violation of Act. Indeed, the Board has processed petitions for an election where a recognition agreement was obtained without the union first proving its majority status. Thus, in S. Abraham & Sons, Inc., 193 NLRB 523 (1971), the union sent a demand letter to the employer claiming that it held authorization cards signed by a majority of employees and offering to submit the cards to a neutral third party. Instead of submitting the cards to a third party, the union called a strike and, thereby, forced the employer to grant recognition and bargain. Both the employer and a second union filed petitions with the Board. The Board found that inasmuch as the first union had not demonstrated its majority before recognition was granted, the representation bar policy did not apply and ordered an election.

As recognized by the majority in the Dana and Metaldyne cases, the Board has not, in the past, squarely addressed the question of whether the representation bar policy adopted in Keller Plastics should be applied to recognition obtained pursuant to a neutrality agreement and entered into at a time when the union did not possess a card majority. Clearly, voluntary recognition should not constitute a bar if recognition is granted pursuant to a neutrality/card check agreement and is entered into at a time when the union lacked majority support.

Statistics show that where employees are allowed to choose between representation and no representation through free choice, they are less likely to choose representation. Thus, in the overwhelming majority of instances in which companies and unions agree to neutrality/card checks, unions receive the number of cards necessary to

establish a card majority and, therefore, obtain recognition. By comparison, unions won only 38.2 percent of decertification elections held in 2003.[11]

VI. CONCLUSION

The Act provides that "[r]epresentatives designated or selected for purposes of collective bargaining by the majority of the employees in an appropriate unit for such purposes shall be the exclusive representative of all employees in such unit for purposes of collective bargaining."[12] There can be no assurance in the instant cases that a true majority has designated the Union since the card checks to determine representation were performed by ill-equipped "laypersons."[13]

Even assuming arguendo a valid card majority existed, by virtue of a pernicious neutrality agreement, employees were denied an opportunity to make a reasoned decision based upon complete and accurate information. In these circumstances, the "laboratory conditions" set forth by the Board for its elections to insure employee free choice has not been achieved.

To achieve these fundamental requirements, the Board now must remove the representation bar to an election in all cases in which a union obtained voluntary recognition in circumstances presented herein. Clearly, the factual context in which the Board developed the doctrine of recognition bar, as set forth in Keller Plastics and its progeny, did not involve neutrality agreements extant herein. Moreover, the Board did not have the benefit of the forensic studies discussed herein. At a minimum, assuming

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[11] See BNA Plus report summarized at http://www.bna.com/press/2004/nlrb04.htm.

[12] 29 U.S.C. § 157.

[13] Even a federal mediator who performed the card check in the *Metaldyne* case is a "layperson" for purposes of conducting scientific handwriting comparisons.

arguendo that such bar is not completely removed, it is urged that the Board modify the representation bar policy to permit the processing of decertification petitions filed within standard 45 days of voluntary recognition.

For the reasons stated above, the Section 7 rights of employees must trump all other competing interests!

Respectfully submitted,

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Dated: July 14, 2004

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the 14th day of July, 2004, copies of the foregoing Brief for the Tennessee Chamber of Commerce and Industry as Amicus Curiae Supporting Petitioners, were served via Federal Express, Overnight Delivery, upon the following:

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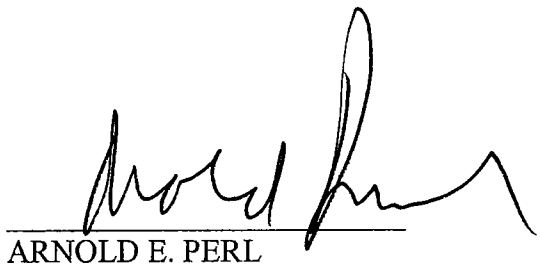

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Signature Authentication by Forensic Document Examiners

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ABSTRACT: We report on the first controlled study comparing the abilities of forensic document examiners (FDEs) and laypersons in the area of signature examination. Laypersons and professional FDEs were given the same signature-authentication/simulation-detection task. They compared six known signatures generated by the same person with six unknown signatures. No *a priori* knowledge of the distribution of genuine and nongenuine signatures in the unknown signature set was available to test-takers. Three different monetary incentive schemes were implemented to motivate the laypersons.

We provide two major findings: (i) the data provided by FDEs and by laypersons in our tests were significantly different (namely, the hypothesis that there is no difference between the assessments provided by FDEs and laypersons about genuineness and nongenuineness of signatures was rejected); and (ii) the error rates exhibited by the FDEs were much smaller than those of the laypersons. In addition, we found no statistically significant differences between the data sets obtained from laypersons who received different monetary incentives.

The most pronounced differences in error rates appeared when nongenuine signatures were declared authentic (Type I error) and when authentic signatures were declared nongenuine (Type II error). Type I error was made by FDEs in 0.49% of the cases, but laypersons made it in 6.47% of the cases. Type II error was made by FDEs in 7.05% of the cases, but laypersons made it in 26.1% of the cases.

KEYWORDS: forensic science, questioned document examination, signature, validation, handwriting

Forensic examination of signatures is performed for authentication of legitimate signatures and for detection of simulations, transfers, and other attempts to manipulate and misrepresent signatures. In adjudicating disputes over signatures, courts often use the testimony of professional forensic document examiners (FDEs). FDEs are called upon due to their reputed expertise in signature examination, deemed to have been developed through "knowledge, skill, experience, training, or education" (Rule 702, Federal Rules of Evidence).

The proficiency of FDEs has become a topic of vigorous debate in the last few years, receiving growing attention in the scientific literature, the courts, the popular press, and law reviews (1–3). Much of this debate stemmed from the scarcity, at least until 1994, of controlled studies that compared the performance of professional FDEs to the performance of laypersons in document-examination tasks. Several controlled studies have been conducted and reported since then (1–3), but they all used *freely and naturally prepared* handwritten texts. In this paper we report on the first controlled study involving *simulated signatures.* We compare the capabilities of FDEs and laypersons in authenticating genuine signatures and detecting simulated ones.

In May 1998 we conducted a comprehensive test of signature authentication, involving 69 FDEs and 50 laypersons (referred to collectively as the "test-takers"). Each test-taker was required to compare two sets of data: (i) the *known* set, comprising six original signatures written by the same person; and (ii) the *unknown* set, comprising six signatures of unknown origin. The number of nongenuine signatures in the *unknown* set could have been any integer from zero to six.

Our study had three objectives:

(i) test the hypothesis that there is no difference between the assessments of FDEs and laypersons about genuineness and nongenuineness of signatures;
(ii) calculate the *error rates* of FDEs and laypersons in the authentication of genuine signatures and the detection of simulated signatures; and
(iii) test the hypothesis that monetary incentives that we offered to the laypersons who took our tests changed the data generated by them.

Organization of the Paper

We provide a summary of the main results, including tables of error rates exhibited by the FDEs and the laypersons. We then provide a detailed description of the test, including data collection procedures and details on the monetary incentives offered to laypersons. The rest of the paper is devoted to statistical tests. We describe the criteria for data comparison, the hypotheses tested, and the results of the statistical tests.

Summary of the Main Results

Comparison of Data

Using standard statistical tests, the hypothesis that there is no difference between the assessments provided by FDEs and laypersons about genuineness and nongenuineness of signatures was *rejected.* We found significant statistical differences between the data generated by FDEs and by laypersons. The laypersons wrongly

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classified nongenuine signatures as "genuine" 13 times more often than FDEs. The laypersons wrongly classified genuine signatures as "nongenuine" four times more often than FDEs. There were no statistically significant differences between the data sets obtained from laypersons who received different monetary incentives in our tests.

Performance

The FDEs made far fewer mistakes than laypersons, as demonstrated in Table 1. The table shows the conditional probabilities Pr (declared signature to be α | signature was β) where *test-taker* $\in$ {FDE, layperson}, $\alpha \in$ {genuine, nongenuine, indeterminable with respect to genuineness}, and $\beta \in$ {genuine, nongenuine}.

A posteriori *Error Probabilities*

The FDEs had much lower *a posteriori* error probabilities compared to laypersons. Table 2 shows these probabilities. They are in the form Pr (Signature was nongenuine | *test-taker* declared signature to be genuine), Pr (Signature was genuine | *test-taker* declared signature to be nongenuine).

Methods

Description of the Test

Data Collection and Data Organization—We recruited 64 individuals for about 3 h of work, requiring the provision of handwritten samples and other tasks. The individuals were graduate and undergraduate students aged 19 to 30 enrolled at the time at Drexel University. No member of this group had past expertise with professional examination of documents, nor had any participated in Drexel University's research on forensic document examination. These recruits were compensated for their services ($25).

In the course of the 3-h period, each participant provided 12 freely and naturally executed examples of his/her normal signature. Each signature was executed on a single, white, unattached sheet of paper (several types of paper of different weights were used). All signatures were written with medium-tip blue or black Bic ballpoint pens, supplied by the authors. Proper care was exercised to avoid leaving any indentation or trace from one signature on a page containing another signature. All pages with the contributed signatures were assigned random numbers for identification purposes.

TABLE 1—*Error distribution in the signature authentication/simulation-detection test.*

	Decision					
	"QS = G"		"QS = ?"		"QS = NG"	
Truth	FDEs	Laypersons	FDEs	Laypersons	FDEs	Laypersons
QS = G	85.89%	70%	7.05%	4.3%	7.05%	26.1%
QS = NG	0.49%	6.47%	3.45%	1.4%	96.06%	92%

"QS = G": Questioned signature is genuine.
"QS = NG": Questioned signature is nongenuine.
"QS = ?": Test-taker could not determine whether the questioned signature was geuine or nongenuine.

TABLE 2—A posteriori *error probabilities.*

	P (NG | "G")	P (G | "NG")
FDEs	0.008	0.08
Laypersons	0.070	0.25

TABLE 3—*Distribution of genuine and nongenuine signatures in the "unknown" package (i:j means i signatures in the "unknown" package are genuine, j are nongenuine).*

6:0	5:1	4:2	3:3	2:4	1:5	0:6
2	7	17	21	12	4	1

The signatures provided by the recruited individuals were all genuine, naturally and freely prepared, and involved no self-tracing or self-copying. All 12 signatures provided by each participant were compared with his/her signature on a check-in form that had been signed before the session began. To the best of our knowledge, all signatures were created in the manner normally used by the signing individuals, using their real names and the normal procedure by which these individuals usually write their signatures.

Each 12-signature set was then divided into two six-signature subsets. Each signed page received a random code number. We used a random assignment of each one of the signed and coded sheets to one of the two subsets. One subset was labeled "known" and other "unknown." Each "unknown" set was then assigned a random number from 0 to 6, indicating how many genuine signatures were to be removed from the set and replaced by simulations. Table 3 shows the distribution of genuine/nongenuine ratios in the resulting packages.

Seven individuals, distinct from the signature providers, were recruited to execute the simulations, using the manual techniques described in a text on forensic document examination (4). To the best of our knowledge, these seven individuals had no prior experience in signature simulation. They used tracing paper, carbon paper, flashlights, and overhead projectors. No computer-generated manipulations were involved, nor were computers used in any other way to create the simulated signatures.

Each simulation was created by a single individual who was provided with the six genuine signatures of the appropriate "known" set and was allowed unlimited time to practice and experiment in the "creation" of a simulation. If two simulations were required for an unknown set, two individuals supplied one simulation each for that set. If three to six simulations were required, up to three individuals supplied simulations, with no more than two simulations provided by any one individual. No auto-forgeries of any kind were requested or executed (as no individual who created original signatures was included in the group of simulators). Nongenuine signatures were created on white sheets of paper of the same types used during the signature-collection sessions. The pages with the simulated signatures were also assigned random numbers for identification purposes.

Random number generation and code management were exercised according to the common procedures for securing codes for one-time-use. Individuals who did not possess our secured master identification list would not be able to separate genuine signatures from nongenuine signatures to any statistically significant degree on the basis of, or through the aid of, the random identification numbers.

Test-Takers—The test was administered four times. On May 9, 1998, in San Diego, California, the test was taken by 44 FDEs attending a meeting of the Southwestern Association of Forensic

Document Examiners. On May 14, 1998, in Rockville, Maryland, the test was taken by 12 FDEs attending the Mid-Atlantic Association of Forensic Scientists. On May 18, 1998, in New York City, the test was taken by 13 FDEs attending a meeting of examiners from the area. On November 17, 1998, in Philadelphia, Pennsylvania, the test was taken by 50 laypersons. The laypersons were students (graduate and undergraduate), staff members, and faculty of Drexel University. The laypersons group was selected to resemble the educational profile of the forensic document examiners. (A detailed questionnaire on education and background was distributed to all FDE test-takers, and almost all completed it in full voluntarily).

The professional FDEs who took our test all met at least one of the following requirements:

(i) certification by the American Board of Forensic Document Examiners (ABFDE);
(ii) membership in the American Society of Questioned Document Examiners (ASQDE);
(iii) membership in the Southwestern Association of Forensic Document Examiners (SWAFDE); or
(iv) membership in the Questioned Document section of the Mid-Atlantic Association of Forensic Scientists (MAAFS).

Test Administration

All test-takers were provided with the following information:

(i) the *known* set contains genuine signatures provided voluntarily by a single individual in the course of a single sitting.
(ii) the *unknown* set contains an unknown number (0 to 6) of genuine signatures written by the person who provided the signatures in the *known* subset. The other signatures in the subset (6 to 0) were written by a simulator or by several different simulators.

All test-takers were allowed to use hand-held magnifiers and a light source, as well as microscopes of the kind used in regular forensic document examination practice. Magnifying glasses, light sources, and microscopes of equal quality were supplied to the laypersons in the Philadelphia test.

Test-takers were requested to state that a signature in the unknown set was written by the person who provided the known signatures (genuine) if they could declare "identification" or "strong probability" per ASTM Standard E1658.

Test-takers were requested to state that a signature in the unknown set was not written by the person who provided the known signatures (nongenuine), if they could declare "elimination" or "strong probability did not write" according to the same standard. These terms were explained at length to the laypersons.

Monetary Incentives

We use the following notation:

A "correct decision" means that a genuine document was declared genuine or nongenuine signature was declared nongenuine.
A "serious error" means that a genuine signature was declared nongenuine or when a nongenuine signature was declared genuine.
"Indecision" means that the document was not declared either genuine or nongenuine.

TABLE 4—*Incentive table.*

Correct Decision	Serious Error	Indecision
\$8	−\$8	\$0
\$8	−\$8	\$4
\$8	−\$8	−\$4

Three types of monetary incentives were offered to the laypersons.

(i) Line 1 in Table 4 shows the first incentive. Correct decisions and serious errors were rewarde-d and penalized, respectively, by \$8 per decision. Conservatism, manifested by indecision, was neither rewarded nor penalized. If the total reward was less than \$24, the test-taker received \$24.
(ii) Line 2 in Table 4 shows the second incentive. Correct decisions and serious errors were rewarded and penalized, respectively, by \$8 per decision. Conservative decisions were rewarded by \$4 per decision. If the total reward was less than \$24, the test-taker received \$24.
(iii) Line 3 in Table 4 shows the third incentive. Correct decisions and serious errors were rewarded and penalized, respectively, by \$8 per decision. Conservative decisions were penalized by \$4 per decision. If the total reward was less than \$24, the test-taker received \$24.

Each layperson was aware of his/her monetary incentive before beginning the test. As we explained previously (3), these monetary incentives are relatively high when compared to the common practice in experimental psychology.

Criteria for Data Comparison

We used three criteria to compare the data provided by the test-takers.

Criterion I: Error Rates

There are four possible errors in our test:

Ia. False authentication: (false ID) — a test-taker is given a nongenuine signature but declares that it is genuine;

Ib. Failure to detect simulation: (missed Elim) — a test-taker is given a nongenuine signature but cannot come to any one of the definitive conclusions (identification/strong probability/strong probability did not write/elimination);

IIb. Failure to authenticate: (missed ID) — a test-taker is given a genuine signature but cannot come to any one the definitive conclusions (identification/strong probability/strong probability did not write/elimination);

IIa. False simulation-detection: (false Elim) — a test-taker is given a genuine signature but declares that it is a simulation.

Of the four errors, Ia and IIa are more serious errors than Ib and IIb. The selection of Ib or IIb may reflect conservatism on the part of the test-taker. The four types of errors are *linked* (e.g., one can avoid Type I errors and increase Type II errors by refraining from making any declarations of genuineness).

TABLE 5—*P-rank.*

P-rank	# of Correct Decisions (G | G), (NG | NG)	# of Conservative Errors (? | G), (? | NG)	# of Serious Errors (NG | G), (G | NG)
1	6	0	0
2	5	1	0
3	4	2	0
4	3 or fewer	3 or larger	0
5	more than 3	any	1
6	less than 3	any	1
7	any	any	2
8	any	any	3
9	any	any	more than 3

G = Genuine, NG = Nongenuine, ? = No decision

Criterion II: P-rank

As we have done previously (2,3), we divided our test-takers into nine groups based on performance. The assignment of an individual to a category depends on the difficulty of the test taken by that individual and on his/her capabilities. Therefore the P-rank is useful for comparison of the two data distributions (of the FDEs and the laypersons) while using the same tests, but not for direct proficiency assessment of the individuals who took the test or the groups of individuals. Table 5 shows the assignment.

Statistical Tests

The literature (5–8) offers a number of statistical tests for comparing samples, each relying on its own set of assumptions regarding sample size and statistical distributions of the data. Our study requires tests that compare data from two groups (e.g., FDEs versus laypersons) and data from k ($k \geq 3$) groups (e.g., data from the three groups of laypersons). For each criterion we use a test on *distributions* (of the Kolmogorov-Smirnov type), and a test on *locations* (of the Mann-Whitney type).

Four statistical tests were used: the first two are distribution tests; the other two are location tests. We described the choice and use of these tests in (2).

The Kolmogorov-Smirnov (KS) two-sample test (2) was used to decide whether or not two independent samples have been drawn from the same population (or from populations with the same distribution).

The Birnbaum-Hall (BH) k-sample test (2) was used to decide whether k independent samples have been drawn from populations with the same distribution.

The rank test of Mann and Whitney (MW) (2) was used to test whether populations of two independent samples differ with respect to their means.

The Kruskal-Wallis (KW) one-way analysis of variance by ranks (2) was used to decide whether $k \geq 3$ independent samples are from different populations with respect to means.

Hypotheses Tested

Using the four error rates and the P-rank as the scoring criteria, three hypotheses-tests were conducted. We tested data from: (i) the group of FDEs and the group of all laypersons and (ii) the three sub-groups of laypersons who received different monetary incentives.

Hypothesis-Test 1 (Group of FDEs and Group of Laypersons)—We tested the hypothesis that *there is no significant difference in the scores collected from the group of FDEs and the group of laypersons (H_0)* against the hypothesis that *there is a significant difference in the scores collected from the two groups (H_1).*

Hypothesis-Test 2 (Three Sub-Groups of Laypersons)—We tested the hypothesis that *there is no significant difference in the scores collected from the three sub-groups of laypersons that had different monetary incentives (H_0),* against the hypothesis that *there is a significant difference in the scores collected from the three sub-groups of laypersons that had different monetary incentives (H_1).*

Results/Discussion

Results of Statistical Tests

Results for Professionals—The results of the two hypothesis tests against the three scoring criteria using the Kolmogorov-Smirnov and location tests are given in Tables 6 and 7. The distribution tests provide the following conclusion with respect to all three criteria: the data generated by the FDE group and the layperson group came from populations that are statistically *different.*

Monetary Incentives for Laypersons—We compared the three groups of laypersons who had different monetary incentives. We used the three scoring methods discussed above. Results are shown in Table 8. The tests *do not reject* the hypothesis

TABLE 6—*Hypothesis-test 1 using the Kolmogorov-Smirnov distribution test: should we accept the hypothesis that the samples collected from the FDEs come from the same population as the laypersons?*

H_0: These Samples are from the Same Population Using . . .	Statistic	*p*	Decision
FalseID	0.285	1.20E-2	Reject
FalseElim	0.271	1.97E-2	Reject
P-rank	0.318	3.52E-3	Reject

TABLE 7—*Hypothesis-test 1 using the Mann-Whitney location test: should we accept the hypothesis that the samples collected from the FDEs come from the same population as the laypersons?*

H_0: These Samples are from the Same Population Using . . .	Statistic	*p*	Decision
FalseID	2.50	1.26E-2	Reject
FalseElim	3.36	7.70E-4	Reject
P-rank	3.54	4.01E-4	Reject

TABLE 8—*Hypothesis-test 2 using the Kruskal-Wallis location test: should we accept the hypothesis that the samples collected from the three groups of laypersons who had different monetary incentives came from the same population?*

H_0: These Samples are from the Same Population Using . . .	Statistic	*p*	Decision
FalseID	2.39	0.303	Do not reject
FalseElim	3.87	0.144	Do not reject
P-rank	1.28	0.528	Do not reject

that different incentives do not affect the performance of the laypersons.

Conclusions

We found that in a signature authentication task, data generated by FDEs are statistically different from data generated by laypersons. In addition, error rates of the FDEs were much lower than those of the laypersons. These results point to the superiority of FDEs over laypersons in determination of genuineness of signatures and in detection of simulations. The continued failure of monetary incentives to induce changes in the laypersons data (3) may indicate that money alone—without training and practice—cannot induce laypersons into good performance as forensic document examiners.

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