

Decision Making in Child Protective Services: A Risky Business?

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Child Protective Services (CPS) in the United States has received a torrent of criticism from politicians, the media, child advocate groups, and the general public for a perceived propensity to make decisions that are detrimental to children and families. This perception has resulted in numerous lawsuits and court takeovers of CPS in 35 states, and calls for profound restructuring in other states. A widely prescribed remedy for decision errors and faulty judgments is an improvement of risk assessment strategies that enhance hazard evaluation through an improved understanding of threat potentials and exposure likelihoods. We examine the reliability and validity problems that continue to plague current CPS risk assessment and discuss actions that can be taken in the field, including the use of receiver operating characteristic (ROC) curve technology to improve the predictive validity of risk assessment strategies.

KEY WORDS: Child Protective Services; hazard; risk assessment

In 2010, an estimated 3.3 million referrals for alleged child maltreatment were made to Child Protective Services (CPS) agencies across the United States, with approximately 2 million of these referrals deemed appropriate by these agencies for investigation or assessment.⁽¹⁾ A decade earlier about 3 million referrals were received and 1.8 million of these were investigated or assessed.⁽²⁾ Concomitant with this steady rise in reports and investigations has been the erosion in public confidence in CPS and its capacity to protect America's children from harm.

The crisis of confidence in CPS finds expression through a variety of channels frequented by a diverse collection of stakeholders and constituencies. Social and behavioral science professionals are trou-

bled with findings on CPS shortcomings reported by a variety of federal agencies and private organizations. The Child and Family Services Reviews (CFSRs) conducted in 2001–2004 and again in 2007–2010 by the U.S. Department of Health and Human Services—Administration for Children and Families (HHS-ACF) provide one example. These reviews of samples of child welfare cases in all 50 states and the District of Columbia indicate declines in compliance with system and outcome measures believed by experts to be critical for high-performing service. The declines in states achieving substantial conformity on child outcome measures are especially alarming (CFSR database 2001–2004; CFSR database 2007–2010).

Lawmakers, politicians, and child advocacy groups point to the spate of lawsuits filed against state human services and CPS agencies for alleged failures to protect children under provisions of the U.S. Constitution, a state's constitution, or federal child welfare legislation.^(3,4) In recent years 37 states and the District of Columbia have been involved in

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some type of CPS class action litigation and nearly two dozen states have been faced with court orders or injunctions that place management control of child protection in the hands of court-appointed monitors, expert panels, or external legislative bodies.

No factor has played a greater role in the diminution of public confidence in CPS, however, as has the singularly disturbing instance (or instances) of child maltreatment that arouse in the lay and professional communities alike the cognitive and emotional awareness that they have encountered the utterly inhuman. Child fatalities and other severe maltreatment cases are horrifying events that very often produce moral outrage, an angry emotion that frames failures to protect children as violations of accepted social norms and, in addition, demands redress, typically in the form of retribution.⁽⁵⁻⁷⁾

Horrible cases of child abuse provide compelling human interest stories prized by the media.^(8,9) Where such stories can be interwoven with reports of public agency failure or scandal, another favorite media topic, the outrage can be maintained and even intensified. Horrible cases of maltreatment that occur while the child is under CPS supervision not only have the potential to stimulate broad child welfare reform efforts, these cases can also produce major disruptions in agency operations^(7,10) and generate posttraumatic stress in CPS workers.^(5,11,12) Thus, both directly and indirectly outrageous instances of child maltreatment have the potential to dramatically alter the decision-making processes in CPS, perhaps even in a more profound way than quality control audits and/or accountability (re)structuring strategies have ever been shown to do.

1. RISK ASSESSMENT APPROACHES IN CPS

Efforts to improve CPS management/operations and restore public confidence have been more or less ongoing with remedies ranging from new training curriculum, innovative case management methods, and staff hiring practices, on the one hand, and to complete system reform and privatization on the other.⁽¹³⁻¹⁵⁾ The endeavor that concerns us in this article is the movement to structured risk assessment and decision-making protocols and why this movement has fallen short in dramatically improving CPS decision making.

Currently, there are three general approaches employed by CPS supervisors and workers to appraise risk and to make casework decisions on the basis of this appraisal, viz., consensus or structured

clinical assessment, actuarial methods, and structured decision making (SDM), which is a sort of actuarial-clinical hybrid. Actuarial risk assessment models were introduced to CPS from the field of juvenile justice with researchers at the National Council on Crime and Delinquency particularly influential. Examples of the actuarial risk assessment tools that have been used in CPS work include the Wisconsin Delinquency Risk Model,⁽¹⁶⁾ the Michigan Family Risk Assessment of Abuse and Neglect (FRAAN),^(17,18) and the California Family Risk Assessment, a slight modification of FRAAN.⁽¹⁹⁾ The structure of these instruments illustrates a limited set of attributes, some valued more than others, added together to form an overall risk score. Scores above some cutoff point are used to identify high-risk cases. Items typically measure number of prior investigations, previous injuries, drug/alcohol issues, and caretaker history of abuse/neglect. The scale can be linked, usually through some type of regression analysis, to the outcomes of worker choices gleaned from records or observation. An especially appealing feature of actuarial instruments is their brevity (8-12 items) and efficiency. A possible limitation and one that has major implications for prediction of abuse/neglect is that all the pertinent attributes are not included and subsequent regression analyses can suffer from omitted variables bias. These omitted variables may be of two kinds, e.g., unmeasured case characteristics and/or contextual factors influencing worker choices, regardless of the case risk score computed.^(19,20,21)

Consensus or structured clinical forms of risk assessment, obversely, are compiled by panels of experts who draw upon previous research findings, literature reviews, and clinical opinion to construct rating scales anchored around distinctive sets of risk factors that can be simply added (or weighted and added in some cases) to form an overall assessment of risk. Several of the more prominently used consensus tools are the Illinois Child Abuse and Neglect Training System (CANTS) 17B, the Washington Risk Model (WRM), the California Family Assessment Factor Analysis, and the New York Child Protection Services Document (CPSRD).^(22,23) Consensus-based risk assessment protocols tend to be much more detailed than actuarial models and require workers to rate children and families in distinctive conceptual domains. The WRM matrix, developed by the Department of Social and Health Services, Washington State, contains 37 weighted items organized around seven distinctive domains, viz.,

child characteristics, case severity, chronicity, caretaker characteristics, relationships, social/economic factors, and perpetrator access. Here, again, overall scores are calculated and those above some cutoff point are believed to identify a high risk of child maltreatment.

Structured decision-making models typically use risk assessment instruments as one component in an information gathering process.^(19,24) A risk assessment score, usually from an actuarial tool, is combined with clinical evidence in the form of family strengths analysis, safety considerations, response priority, case planning standards, and children's needs to classify a case from low to very high risk. The model is premised on the notion that an integration of risk and clinical context serves not only to improve triage, it also helps insure the most appropriate and efficient application of limited CPS resources.^(19,25) Even though a risk assessment score per se is not used to identify suspected maltreatment, SDM integrates the actuarial and clinical data to inform a worker's decision-making process that ultimately results in the specification of risk cutoffs.

No matter which risk assessment instrument or protocol is utilized, the primary objective of these decision tools is to convert uncertainty and ambiguity into expressions of relative risk through a complete accounting of the risks confronting children.

2. THE FOUNDATIONS OF TRADITIONAL CPS RISK ASSESSMENT

The basic architecture of CPS decisions has been depicted in any number of articles and texts;^(20,26) we provide the rendering disseminated by the National Clearinghouse on Child Abuse and Neglect Information⁽²⁷⁾ in Fig. 1.

It is relatively clear from the figure that the CPS staff, case workers, and immediate supervisors need to make choices on whether or not to investigate a case, to substantiate a report(s), remove a child from home, or return a child home. There are also decisions on the level of services that should be provided and the critical decision on when to close a case. What isn't so transparent from the structure of the CPS decision process is the frequency with which choices are made under conditions of significant risk *vis-a-vis* choices made under certainty or uncertainty. The distinction is not a trivial one, especially for CPS workers who must make the decisions depicted in Fig. 1. Fig. 2 presents three scenarios, viz., (2a) a set of information that allows a decision-

maker to know when an event will occur with certainty; (2b) information that does not allow the decisionmaker to be certain about specific events but provides the probabilities of each event occurring more or less precisely, i.e., risk; and (2c) information is too ambiguous to provide probabilities for a single distribution of events but instead indicates alternative probability distributions, each of which has its own probabilities.⁽²⁸⁾

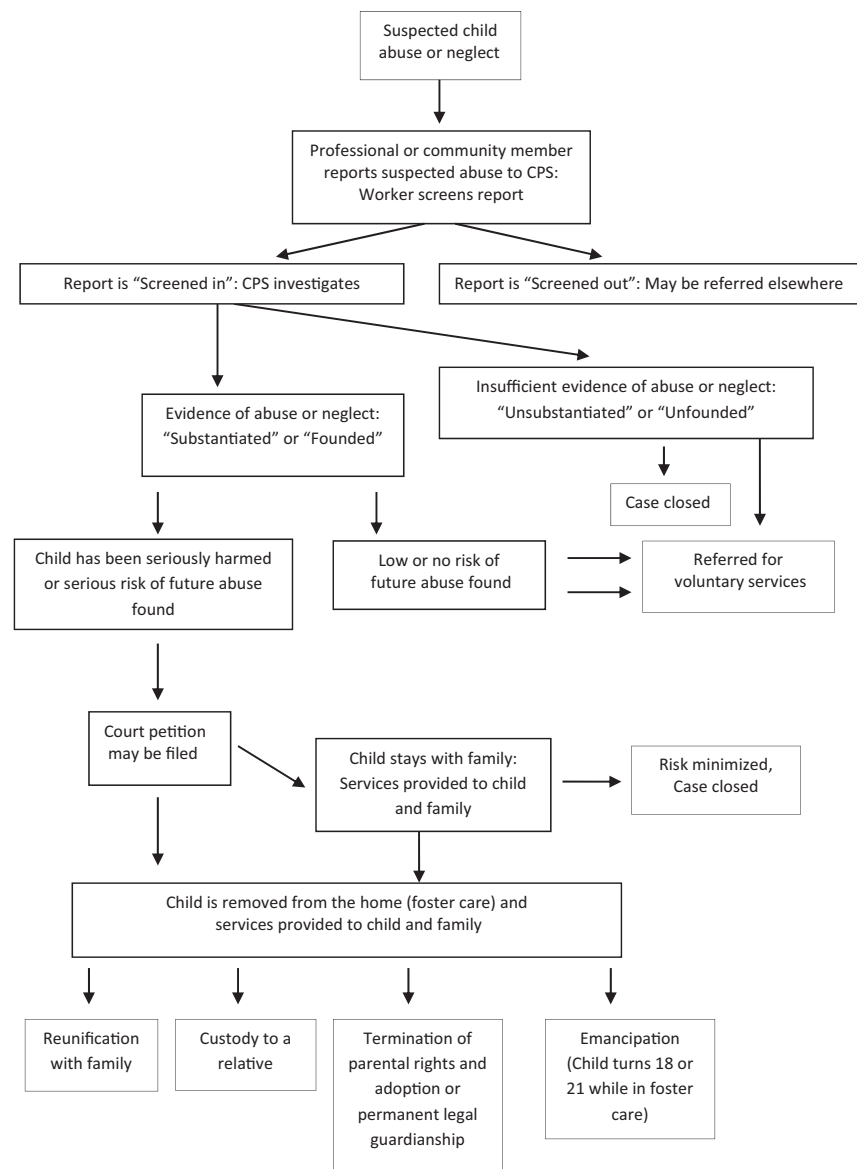
Decision making under certainty, a relatively uncommon circumstance in CPS, assumes that the decisionmaker is able to enumerate all possible courses of action, know the strategies necessary to carry each out, and can project the consequences of actions taken with complete assurance. It implies that there is a single empirical reality to which the decisionmaker can attach a probability of 1.0. In Fig. 2(a) we show this circumstance with the state of nature designated as s_i , its associated probability $p(s_i)$, and the utility of a course of action (f) with f 's consequences as $u(f(s_i))$. For example, if a CPS worker gives a very high value (u) to opening cases of child abuse (f) in homes characterized by very young children, nonwhite parents who use illegal drugs and have income below the poverty level (s_i)⁽²⁹⁾ and the probability of abuse $p(s_i)$ in such homes has been shown or is believed to be 100%, the worker, if rational, would always open such cases. No matter what the amount of value a worker attaches to not opening cases for reasons of workload, personal prejudices, etc., it would be a fool's errand to do so with this type of case because the probability of no abuse, i.e., $1 - p(s_i)$ would be 0.

When decisions are made under conditions of risk there is an assumption of multiple states of nature and known probabilities assigned to each state that are derived from relative frequencies of event occurrences (observed prevalences). If instead of a 100% likelihood of abuse (Fig. 2(a)), there was a 60% chance of abuse the decision to open or not open would depend on the utility a worker has for each course of action and the probabilities attached to the occurrence of each event. When, for example, a worker has a value of 10 for opening a case of abuse, a value of 1 for an incorrect opening, a value of 5 for not opening a case that does not have abuse, and a 2 value for an incorrect nonopening, then two utilities can be calculated,

$$\text{Open} = 10(0.6) + 1(0.4) = 6.4,$$

$$\text{Notopen} = 5(0.4) + 2(0.6) = 3.2.$$

Fig. 1. The child welfare system and principal decision points.
 Source: <http://nccanch.acf.hhs.gov/pubs/factsheets/cpswork.cfm>.



Here the risk value of opening far outweighs the risk of not opening. Risk situations here produce a single probability distribution like those in Fig. 2(b).

Decision making under uncertainty shares with risk situations the assumptions of multiple states of nature but lacks the objective probabilities that can be attached to occurring events. In instances where science remains unsettled and/or ambiguous, it is possible to identify probability distributions that emanate from multiple sources, including personal risk evaluation systems. This, of course, implies that distributions of decisions can vary greatly from person to person (Fig. 2(c)) and that the variation is not sim-

ply a function of personal values but is dependent on subjective probabilities.

CPS workers, like many other decisionmakers, acquire training, knowledge, technology, and professional skills that help them as they are encouraged to transform choices made under uncertain conditions into decisions based on more clearly defined risks.^(30,31) The transformation proceeds through a shaping of values around the application of best practices and/or evidence-based practice ($u(f(s_i))$) and, to a lesser extent, by providing workers with a set of objective probabilities for understanding child maltreatment occurrences $p(s_i)$. If successful, a reduction in ambiguity should be accompanied by a

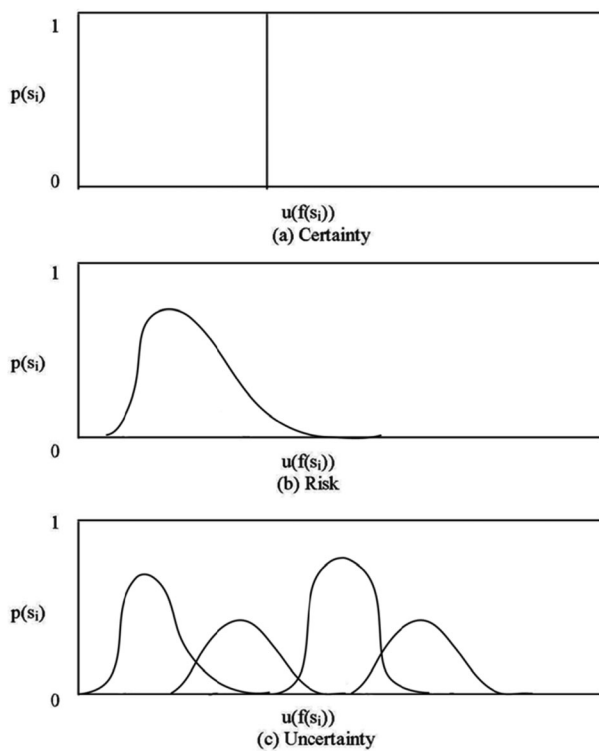


Fig. 2. Distributions of decisions under certainty, risk, and uncertainty. Adapted from Camerer and Weber.⁽²⁸⁾

diminution in unacceptable and unsatisfactory child outcomes.

The child welfare literature is teeming with guidance for case workers and supervisors on how they should navigate the frequently storm-swollen decision-making flows captured in Fig. 1.^(32–36) The Besharov book, *Recognizing Child Abuse*, comes with a 336-page training manual and “six high-quality videos.”⁽³⁷⁾ Especially detailed advice is provided by the more than half-dozen handbooks specifically designed for CPS practice. The American Humane Association’s *Helping in Child Protective Services*⁽³⁸⁾ is published as “a comprehensive desk reference that serves as both a daily guide for workers and a training tool for supervisors and administrators” (p. II). The Dubowitz and DePanfilis *Handbook for Child Protection Practice*⁽³⁹⁾ contains over 120 chapters, most of which begin by asking a specific question—How Do I Assess Risk and Safety? or How Do I Determine If a Child Has Been Sexually Abused? and so on—followed by specific instructions on how to answer the question. Equally comprehensive handbooks and desk references have been written by the American Professional Society on the Abuse of Chil-

dren,⁽⁴⁰⁾ the National Center for Prosecution of Child Abuse,⁽⁴¹⁾ The Annie E. Casey Foundation,⁽⁴²⁾ and the federal government’s Administration for Children and Families (ACF).^(43–45) Although all of these sources no doubt have some utility, none come with published reliabilities and validities.

Despite the ongoing efforts to minimize decision making under uncertainty, the realities of child welfare work often defy categorization of events into mutually agreed upon and unambiguous probability distributions. What’s more, worker attitudes about making risky choices may lead some to take unacceptable chances and cause others to avoid making any difficult decisions at all. If, for example, the expected utility for making the decision to open a case is less than the expected utility from the decision outcome, a worker can be considered to be risk averse. Using the utility model discussed above, the expected value of this worker for making the choice is (as a Bernoulli function): $(\log(10)) (0.6) + (\log(1)) (0.4) = 1.38$, whereas her expected value of the decision outcome is: $\log(6.4)$ or 1.86. If, on the other hand, her value for the choice making was greater than the value received from the choice, this worker could be considered risk inclined.^(31,46)

CPS has faced significant difficulties in its endeavors to understand risks, risk probabilities, and risk utilities and to train case workers and supervisors to become better risk takers and decisionmakers. The efforts have continued unabated, however, and two general strategies for amelioration have emerged. The first strategy calls for reducing uncertainty by modifying and circumscribing the current system.^(47,48) The second strategy calls on the current system to provide better diagnostic, treatment, and service tools and seems to have the support of a majority of the child welfare administrators and practitioners in the country.^(4,9,44)

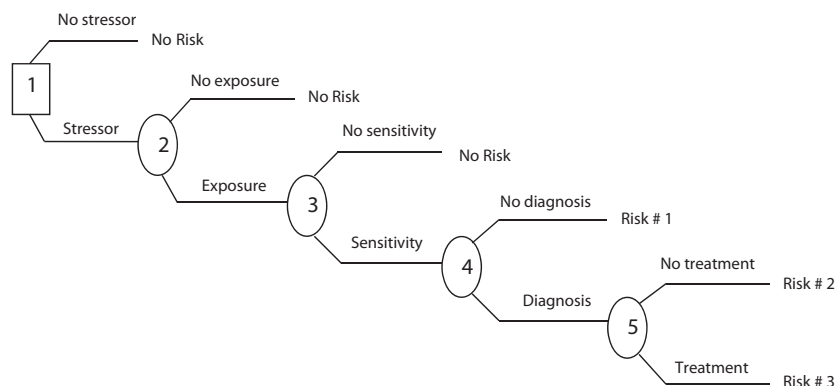
2.1. Risks as Hazards

CPS professionals and child welfare academics typically conceptualize risks to child safety in much the same fashion that public health professions view illness and injury, i.e.,

$$\text{Risk} = f(\text{hazard}),$$

where the hazard embodies the properties of a person, object, or event that poses a threat to personal health and safety. The level of risk posed depends on the magnitude of this threat (state of nature), measured by toxicity and dosage, and the likelihood

Fig. 3. Classical decision tree for hazard analysis and assessment of risk. Adapted from European Commission, Risk Assessment Unit Public Health and Risk Assessment Directorate (2004).



of exposure (probability assigned to these natural states).

A classical decision tree for hazard analysis helps to highlight the complexity faced by a decisionmaker attempting to assess and manage a risk. As shown in Fig. 3, the initial judgment task is to determine if a hazard is present in the environment, followed by a judgment regarding probability of exposure. Exposure assessment requires the decisionmaker to determine how sensitive the victim has been to the stressor, for example, was she affected physically, emotionally, or financially, etc. This information permits the decisionmaker to make a risk calculation and a diagnosis; it also provides an opportunity to make a judgment error if a problem goes undetected—Risk #1 (false negative [FN]). Some diagnosed cases may not suffer from any actual exposure, require no treatment, but could become victimized by the diagnosis itself—Risk #2 (false positives [FP]); still others could succumb to the treatment prescribed even when the diagnosis is correct—Risk #3 (iatrogenic effect).

There are three principal factors that influence decisionmaker success in predicting hazard, viz., (1) the true prevalence rate of the threat, (2) the validity of the decision tool used to gauge probability of exposure, and (3) the reliability or precision of the decision tool. It is an epidemiologic fact, assuming other factors are held constant, that the higher the prevalence of a threat the higher the likelihood that a decisionmaker will be able to identify these threats.⁽⁴⁹⁾ In an epidemic, for example, cases of disease are not very difficult to find. Seldom in CPS decision making are true prevalences of maltreatment known and where they are known they can change, sometimes dramatically. In the absence of actual prevalence, it is necessary to employ estimates and these can yield decision-making mistakes.

Although the prevalence rate is generally outside the control of the decisionmaker, the decision tools at his/her disposal can, in principle, be manipulated and improved to ensure reliability and predictive validity. To illustrate the importance of both these measurement qualities in predicting real hazards to children, we examine a hypothetical population of 100 cases reported to CPS that have all passed through initial screening. Our presentation here builds on the earlier work of Lindsay⁽⁵⁰⁾ and Ruscio.⁽⁵¹⁾ As Fig. 4 Panel (a) shows, this particular population is normally distributed (it doesn't have to be) on a measure of hazard that ranges from 0 (no threat at all) to 60 (maximum threat). The panel also shows the z-score conversion of threat level and three scores (0.25, 0.75, and 1.25) that workers could employ as a threshold below which real cases of child maltreatment are deemed not to occur. In the example we assume that the 0.75 decision point accurately identifies the true prevalence of child maltreatment at (14 + 9 + 5 + 1 + 1) or 30 cases. In Panel (b) we show this ideal scenario of a perfectly precise and accurate decision rule as two distinctive distributions of nonabuser and abuser cases. Note that in our perfect world the two distributions of cases do not overlap: if a worker adheres to the 0.75 threshold consistently no errors in identification will be made.

In Panel (c) we show what happens if a decisionmaker opts to abandon the 0.75 cutoff and use a lower score as a cutoff, in this instance 0.25. It is clear that such a choice increases the number of opened cases by about 20 and adds considerably to the case worker's workload. If a worker knows that 0.75 yields the optimal separation of abusers and nonabusers why would she/he assume such a decision stance? *The answer lies both within the hazard model of risk and outside it.* As Thomas Scheff⁽⁵²⁾ pointed out nearly 40 years ago, social workers and

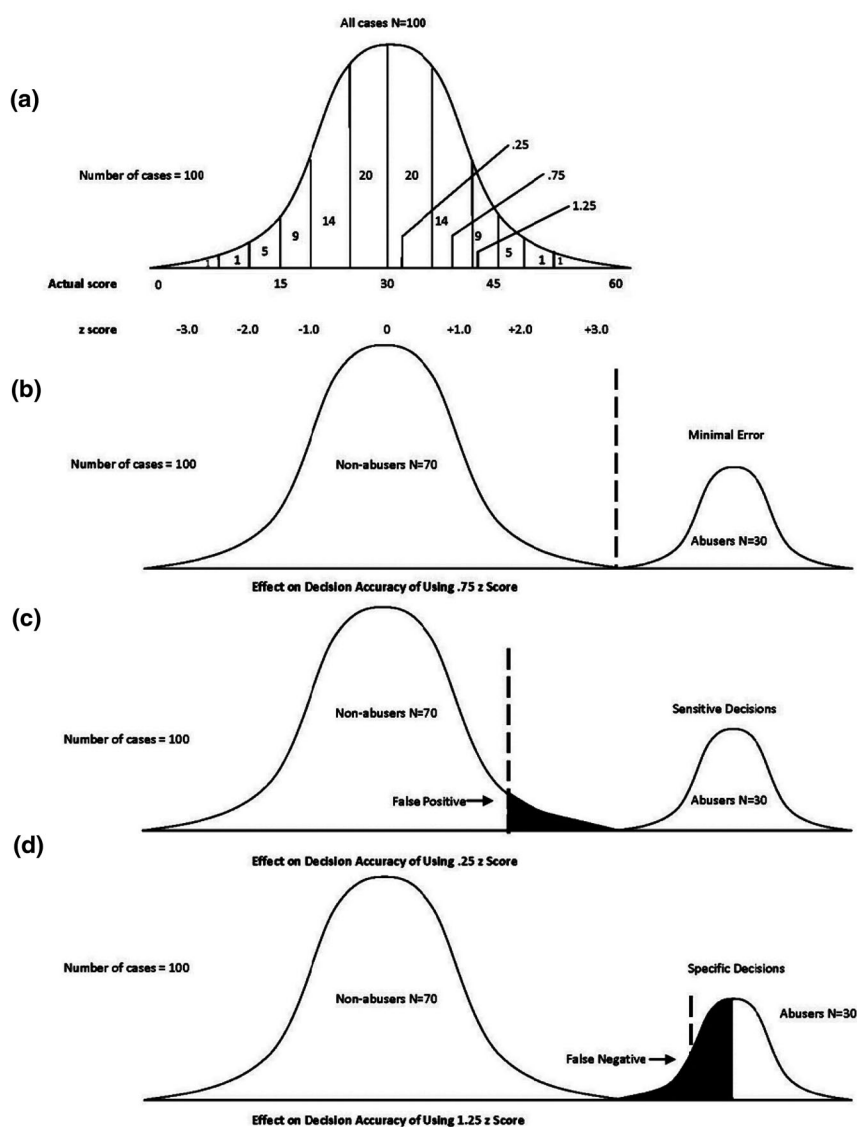


Fig. 4. The impact of using different risk assessment scores to measure threat levels in a hypothetical population of 100 cases.

other helping professionals show a tendency to tolerate higher levels of FP cases, feeling that these cases can be reevaluated later if necessary. In short, there is a tendency to apply the maxim when in doubt, diagnose. This professional tendency is exacerbated, moreover, in environments seeking to make CPS workers more accountable through increases in coverage. Anecharico and Jacobs⁽⁵³⁾ assert that government agencies subject to hyper-scrutiny can create a panoptic vision among workers, a kind of pervasive, eclectic doubt, which can lead to widespread risk aversion.

The distribution of cases in Panel (d) indicates what results when a decisionmaker chooses a score of 1.25 to open cases. FP cases disappear but the prob-

lem of FNs intensifies. In our hypothetical population about half (14) of the actual abuse cases are now deemed unnecessary to open. In light of our assumption of a completely valid and reliable test and cut-off point of 0.75 such an action would be considered indefensible and would probably result in the employee's dismissal from CPS. Risk-inclined workers would be best advised to seek a different profession, perhaps in business, where diagnoses that can ruin opportunity or lives can be made with much more panache.

It needs to be noted that many safeguards are available in the CPS system to redress the problems that accompany FPs. Cases can be kept open for services even if substantiation of maltreatment is

		True Prevalence		True Prevalence		True Prevalence	
		(a) abusers	non-abusers	(b) abusers	non-abusers	(c) abusers	non-abusers
abusers identified		30	0	30	20	16	0
decision threshold scores	.75	(16) TP	FP (15)	(22) TP	FP (28)	(11) TP	FP (5)
		FN	TN	FN	TN	FN	TN
non-abusers identified		0	70	0	50	14	70
		(14)	(55)	(8)	(42)	(19)	(65)

Fig. 5. Case counts in a hypothetical population of 100 cases conditioned on changes in decision cutoffs and decision tool reliability. TP = true positives, FP = false positives, FN = false negatives, TN = true negatives. Values in parentheses indicate counts obtained by adjusting models for 0.25 reliability using the following formula: $1 - \Phi[(1-X)\rho] / \sqrt{(1-\rho^2)}$, where Φ is the cumulative normal distribution function, X is the threshold level, and ρ^2 is the reliability level.

unfounded when services are deemed appropriate to improve child and family functioning. When a child is removed from the home a panoply of checks are invoked, including “reasonable efforts” procedures, independent court review, and termination of parental rights hearings. There are no parallel set of oversight procedures for FN cases where mistakes were made in not investigating or opening a case or not removing a child.⁽⁵⁴⁾

Within the risk-as-hazard perspective of child maltreatment there are several ways to evaluate the validity of a decision tool. Test sensitivity is measured as true positives (TP) divided by true positives plus FNs. The denominator here is all the cases that have the threat. Test specificity, on the other hand, measures the proportion of true negatives (TN) divided by TNs plus FPs and the denominator is all the cases that have not experienced the threat. When a test cutoff is set at a low level it becomes more sensitive, when it is set high it becomes more specific. In Fig. 5(a) we show the case count for cutoff point 0.75, the hypothetical threshold that perfectly distinguishes abuser and nonabuser groups. As is to be expected, the sensitivity and specificity measures are both 100%.

Panels (b) and (c) provide the case counts when decision points 0.25 and 1.25 are utilized. As expected sensitivity remains perfect and specificity drops in (b) and specificity remains perfect and sensitivity drops in (c).

Although sensitivity and specificity provide us with insight into an instrument’s accuracy they do not supply information on the instrument’s predic-

tive power. Positive predictive value measures the proportion $TP/(TP + FP)$ where the denominator reflects all cases with a positive result. Negative predictive value measures the proportion $TN/(TN + FN)$ and has a denominator comprising all cases with a negative classification. As Table I shows, for perfectly reliable instruments ($r = 1.00$) both positive and negative predictive values are 100% for the optimal cutoff point of 0.75 but the former declines when 0.25 decision rule is used whereas the latter declines when 1.25 is used. The table also shows the impacts of cutoff points on test sensitivity and specificity.

Thus far we have examined the outcomes of the risk as hazard model assuming the true prevalence is known and that it is knowable through the lens of a completely valid instrument. If, however, an instrument possesses low reliability, it, by definition, also possesses low validity. The parenthetical counts in Fig. 5 and percentages in Table I are an illustration of what befalls the decision-making process when an instrument has a test-retest, internal consistency or alternative forms reliability of just 0.25, a generous level for child welfare risk assessment instruments.⁽⁵⁰⁾ Our calculations for attenuation follow the formula suggested by Lindsey:⁽⁵⁰⁾

$$1 - \Phi[(1-x)\rho/(1-\rho^2)^{1/2}],$$

where ρ^2 is the reliability level, x is the cutoff point, and Φ is the cumulative normal distribution function. Thus for cutpoint 0.75 instead of the 14 cases we would expect if the instrument was completely reliable we now predict few cases, i.e., $1 - \Phi$

Table I. Classification Calculations in Hypothetical Populations of 100 Cases Conditioned on Changes in Decision Cutoffs and Decision Tool Reliability

	Decision Cutoff 0.75 Reliability	Decision Cutoff 0.25 Reliability	Decision Cutoff 1.25 Reliability
	1.00 (0.25)	1.00 (0.25)	1.00 (0.25)
Test sensitivity	$\frac{30}{30+0} = 100\% (53\%)$	$\frac{30}{30+0} = 100\% (76\%)$	$\frac{16}{16+14} = 53.3\% (36\%)$
Test specificity	$\frac{70}{70+0} = 100\% (79\%)$	$\frac{50}{50+20} = 71.4\% (60\%)$	$\frac{70}{70+0} = 100\% (92\%)$
Positive predictive value	$\frac{30}{30+0} = 100\% (51.6\%)$	$\frac{30}{30+20} = 60\% (44\%)$	$\frac{16}{16+0} = 100\% (68.7\%)$
Negative predictive value	$\frac{70}{70+0} = 100\% (79.7\%)$	$\frac{50}{50+0} = 100\% (84\%)$	$\frac{70}{70+14} = 83.3\% (77.3\%)$

1 – Sensitivity = false negative rate; 1 – Specificity = false positive rate. Values in parentheses indicate counts obtained by adjusting models for 0.25 reliability using the following formula: $1 - \Phi [(1-X)\rho]/\sqrt{(1-\rho^2)}$, where Φ is the cumulative normal distribution function, X is the threshold level, and ρ^2 is the reliability level.

$[(1 - 0.75)(0.5)/(1 - 0.5^2)^{1/2}] = 0.443$; and $(0.443)(14) = 6$ cases.

When we apply this attenuation formula to all segments of the normal distribution in Fig. 4(a) above the 0.75 cutoff we predict five cases at 1.25, 3 cases at 1.75, 1 case at 2.25, and 1 case at 2.75. Now instead of 30 true positive cases we identify a total of 16. All measures of instrument validity take the expected plunge with test sensitivity and positive predictive value suffering especially.

Panels (b) and (c) in Fig. 5 and Table I show the counts of cases and the validities that can be expected with a reliability of 0.25 and z-score cutoffs of 0.25 and 1.25. It is evident that the decisionmaker is faced with two seemingly entangled distributions of abusers and nonabusers and a formidable task of balancing considerations of sensitivity and specificity.

As referrals to CPS agencies across the United States continue on their dramatic rise, decision making under uncertainty or poorly understood risk remains the stubborn reality of daily CPS operations. A distinctive pattern has emerged as cases wend their way through the CPS decision flow: e.g., more cases screened in, more cases investigated, more cases kept under supervision, more FPs.^(14,47,55) Gibbons and his colleagues⁽⁵⁶⁾ have likened CPS to trawling for fish, “casting a tightly woven meshed net in which a large number of minnows are caught—only to be discarded later—as well as the marketable fish.” An analogy perhaps in poor taste, Gibbons is correct in calling attention to the consequences of overidentification—misdirected or wasted resources, trauma inflicted on blameless parents, frustrated politicians. What Gibbons and other child welfare professionals fail to point out is a tragic irony: it is the FN cases that really drive CPS decision making, serving as a sort of over-

correction for agency failure to stop horrific cases of child maltreatment.

3. BEYOND RISK AS HAZARD MODELS

There is a good deal of evidence that has accumulated, mostly in the form of detailed case studies, that singularly disturbing instances of child maltreatment exert strong and long-lasting impacts on CPS management and operations.^(6-9,57) These studies introduce what some have termed in the literature as the “routinization of outrage,” i.e., the process by which social outrage over child fatalities and other horrific instances of child maltreatment penetrate deeply into CPS information, service delivery, and decision-making flows.^(5,58)

The routinization manifests itself in at least three ways that influence CPS decision making. The first is the pressure on child welfare agencies to adopt a standard for “zero tolerance.”^(15,59) This standard seeks the guarantee of no FNs through the screening in of FP as well as true positive cases. In a profession with an uncertain knowledge of true prevalence rates and an arsenal of decision tools with less than perfect reliability and validity, “zero tolerance” sets in motion a norm of risk-averse behavior observable through the use of lower decision cutoff points. Routinization also introduces a second dynamic, i.e., an alteration in worker culture at CPS that results in increased sensitivity to traumatic cases^(11,12,60) and feelings of “infinite jeopardy.”⁽⁶⁰⁾ The ethos of infinite jeopardy places high culture value on “keeping your head down” and further depresses decision cutoffs.

Finally, the social outrage routinization produces abrupt changes in CPS workforce composition in the

form of mass resignations and dramatic increases in new hires. Such changes have been characterized as “punctuated equilibrium,” i.e., system-wide shifts that are rapid from one stable point to another.^(10,61) Punctuated changes insure that CPS adaption will be frenetic, episodic, and partial, predicting long periods of gradually rising decision thresholds followed by short periods of rapidly declining decision cutoffs—a future of endless rollercoaster rides.

Given the importance of social outrage to CPS operations it would appear that a respecification of the public health conception of $\text{Risk} = f(\text{Hazard})$ is warranted. This new specification can be written simply as:

$$\text{Risk} = f(\text{hazard, outrage}),$$

where hazard is defined as before and outrage measures the level of public anger and mistrust in CPS decisions. The idea that risk assessment is not simply a result of technical hazard analysis is not new; risk has long been conceptualized in the fields of environmental science, food safety, chemical engineering, and others as a function of technical and emotional components.^(62,63)

When risk is conceptualized as a function of outrage as well as hazard, CPS is alerted to the necessity of supplementing hazard measurement and management with a strategy for outrage measurement and control. At minimum CPS agencies should be examining the impacts that fatalities and other high-profile media cases have on the decision processes and outcomes of units, supervisors, and workers. The impacts of outrage-precipitated events such as court orders, consent decrees, new child protection laws, substantial alterations in workforce composition or size on decision outcomes and decision rules should also be monitored and studied. The accumulation of these data, in turn, should be employed in an agency risk communication program that (1) addresses the emotion and worry experienced by the general public, (2) acknowledges the profound effect that horrific cases have on child victims and on CPS operations, (3) indicates the agency’s openness to external review by professional organizations and individuals, (4) emphasizes the central importance of (re)gaining public trust, (5) focuses on a high-functioning quality control system, (6) highlights and promotes workforce professionalism, and (7) draws upon an empirically based, fully functioning hazard measurement and management system.

4. HELPING CPS MAKE BETTER DECISIONS

The recognition that social outrage exerts a major contextual influence on CPS risk assessment does not in any way obviate the necessity of an agency committed to a thorough understanding of the hazards confronting children, the precise measurement of threat levels, dosage, and exposures, and the prevalence of these hazards in our communities. Progress in these areas, however, has proven to be halting and transitory.

What Lindsay and others^(14,64,65) in the field of child welfare have been clamoring for is a set of decision-making guidelines modeled after those found in the Cochrane and Campbell Collaborations,^(66,67) and the replacement of compilations of ostensible evidence and practice wisdom found in CPS practice handbooks with information on efficacy obtained from strong research designs. Instead of the development of a robust evidence-based CPS practice, however, child welfare decision making remains enmeshed in a tangle of conceptual prescriptions and prohibitions that have served to confuse practitioners as much as enlighten them. Some child welfare researchers have gone so far as to term this tangle “the risk assessment wars,” an internecine conflict that has generated much more noise than enlightenment.^(68,69) Indeed, some instruments and systems have been found to be superior to others; none, however, approach public health standards of sensitivity and specificity.

Our prescription for a better understanding of hazards would include these components:

1. Employ more classical and natural experimental designs and where this is not possible, stronger quasi-experimental designs like regression discontinuity and Rubin causal models.⁽⁷⁰⁾
2. Continue the promising line of research that employs computer-aided segmentation techniques to model decision points and isolate risk groups.^(16,71–73) Many of these search algorithms have their roots in the multiway contingency table analyses developed at the University of Michigan in the 1960s.⁽⁷⁴⁾
3. Develop and test the relative efficacy of structured decision-making (SDM) approaches that integrate actuarial and consensus-based variables.^(19,75) Factorial experimental and quasi-experimental designs would be ideal for evaluating these approaches.

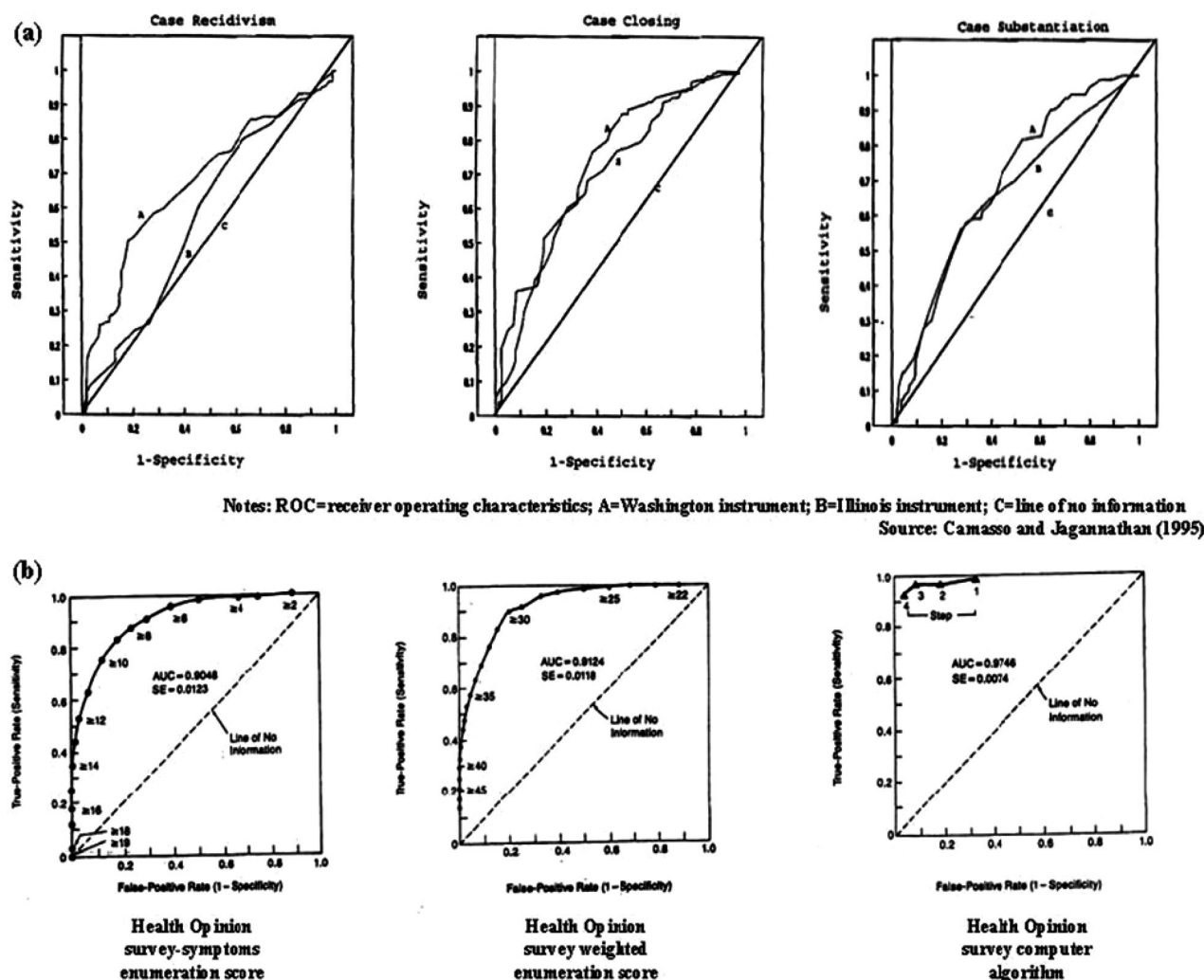


Fig. 6. Receiver operating curves in (a) CPS and (b) medical applications.
Source: Murphy *et al.*⁽⁸¹⁾

4. Institute a requirement by journal editors and reviewers that all studies purporting to measure the prediction or criterion validity of risk assessment applications report both sensitivity levels and positive predictive values of the instruments/models employed.
5. Add an additional requirement that these studies amass sufficient data to undertake a receiver operating curve (ROC) analysis. ROC curves avoid the problem imposed by reporting a single sensitivity and specificity conditioned on one decision threshold; instead, sensitivity and specificity on an instrument are compared over a wide and continuous range of criterion levels. ROC analysis

has a long history in medicine^(76,77) and has been proposed as an important evaluative tool in CPS.^(78,79)

Despite ROC potential for offering rigorous validity evaluations in CPS, the method has been, to our knowledge, employed only once.⁽⁸⁰⁾ These researchers compared the predictive validity of the WRM and Illinois CANTS 17B by plotting each instrument's sensitivity against its FP rate (1 – specificity). The results from the series of analyses are reproduced in the ROC curves that appear in Panel (a) of Fig. 6. The principal diagnostic for validity in ROC analysis appears as areas under the curve measured as

the area between the diagonal line of no information and the curve's left and top trajectory. Curves that trace closely to the diagonal line indicate less or no power to discriminate between real hazard and no hazard.

Camasso and Jagannathan⁽⁸⁰⁾ found that WRM yielded overall prediction accuracies of 68% for case recidivism, 69% for case closings, and 68% for case substantiations. The accuracies for the Illinois instrument were 58%, 74%, and 66%. To contrast these results with higher validity tests that are typical in the fields of medicine and public health, we present in Fig. 6 (Panel (b)), the ROC curves reported by Murphy *et al.*⁽⁸¹⁾ in their analysis of three sets of scoring rules used on the Health Opinion Survey. Here the prediction accuracy for distinguishing the psychiatrically well and ill range from 90% to 97%. As these particular comparisons indicate, CPS risk assessment has a long way to go to reach respectable levels of accuracy. Although ROC analyses help us understand the discriminative validity of an instrument or set of instruments, the analyses do not help us resolve the value issues that accompany any instrument with less than perfect predictive validity. Acceptable levels of both FNs and FPs will likely always be a function of the best professional tools available, public tolerance for errors of omission, and the interaction between the two.

6. Increasingly, the field of child welfare is recognizing the importance of organizational climate and social context for CPS decisions. Discussions by DePanfilis and Girvin,⁽²¹⁾ Brintall,⁽⁸²⁾ and English *et al.*⁽²³⁾ on caseload sizes and time pressures and those by Gambrill,⁽⁶⁴⁾ Gambrill and Shlonsky,⁽⁸³⁾ Rzepnicki and Johnson,⁽⁸⁴⁾ and Osmo and Benbenishty⁽⁸⁵⁾ on task environments have increased our understanding of how immediate work environment affects decisions to protect.
7. Studies of the contextual effects stimulated by social outrage need to be included in this line of inquiry with particular attention paid to impacts on decision cutoff points, their selection, variability, intensity, and duration. A better understanding of the relative importance given to outrage and hazard before and after outrageous cases of maltreatment also needs to be gained.

8. A program of research focusing on the pivotal role played by child fatalities and other horrifying cases of child maltreatment on organization and worker decisions is long overdue in the child welfare literature. Recent reports by Christina Riehl and her colleagues at the Children's Advocacy Institute⁽⁸⁶⁾ and by the U.S. General Accountability Office⁽⁸⁷⁾ highlight the measurement issues this research is likely to encounter and are good points of departure for serious investigations of child fatality impacts.

CPS remains a risky business with too many outrageous consequences. Gaining a better understanding of what distinguishes credible from dubious hazard information and identifying circumstances when outrage and other contextual factors trump even the most impeccable hazard data will go a long way toward improving our understanding of risk in Child Protective Services.

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