

The Contribution of Decision Theory To Promoting Child Safety

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Child welfare practice is, first and foremost, about making effective decisions that promote outcomes of safety, permanence, and well being for abused and neglected children. Further, the accurate and timely identification of children at high risk of maltreatment, either imminent or at some time in the future, is a prerequisite to making the most effective decisions to assure their safety.

In spite of this, many traditional strategies for assessing safety and estimating the risk of future maltreatment can result in decisions that compromise children's safety rather than assuring it (Rycus & Hughes, 2003; Gambrill & Shlonsky, 2000). Historically, child welfare workers have used the case study method to identify children who are "unsafe" and to estimate the likelihood of future maltreatment. They have relied on individualized case assessments, clinical experience, professional judgment, and sometimes intuition to make these determinations. However, even the most experienced and capable social workers may find it difficult to accurately estimate the level of risk in each case situation (Macdonald, 2001; Gambrill & Shlonsky, 2000.) This is the epicenter of the child protection crisis in America. Child welfare decisions are made daily by thousands of individuals with different levels of education, training, and experience, who apply different criteria and thresholds to determinations of safety and risk. This has resulted in widely disparate decisions, even among persons considered to be experts in the field (Rossi, Schuerman, and Budde, 1996).

In a system that must assure efficient, effective, and equitable decisions on behalf of maltreated children and their families, this can create significant problems. Children who are unsafe or at high risk of future harm may remain in high risk situations, while low-risk children may be subjected to intrusive intervention, including out-of-home placement. The serious negative consequences of inappropriate case decisions on outcomes of child safety, permanence, and well-

being contributed to the recent federal emphasis on system accountability for achievement of these fundamental outcomes.

To address disparities in decision making, many child welfare organizations have implemented standardized decision-making models, protocols, and instruments. However, the use of such models has been inconsistent, and their effectiveness has been compromised by a variety of factors (Rycus & Hughes, 2003; DePanfilis, 1996; Curran, 1995). There has been a lack of uniform, relevant, well-articulated criteria on which to base decisions (Lyons, Doueck, & Wodarski, 1996; Cicchinelli & Keller, 1990). Tools and protocols used to guide these decisions often demonstrate poor reliability and validity, or have simply never been researched (Gambrill & Shlonsky, 2000; Pecora, Whittaker, Maluccio, & Barth, 2000; Johnson, 1996; McDonald & Marks, 1991). There are wide disparities in criteria and tools designed to achieve the same objectives, and there is a lack of consistency among workers in their decision-making methods and processes (Gambrill & Shlonsky, 2000; Cicchinelli, 1995). Many child welfare systems have failed to fully and properly implement decision making protocols (Ruscio, 1998; English & Pecora, 1994). And, staff using these protocols have often not been properly trained in their use (Rycus & Hughes, 2003; Pecora et.al., 2000; Curran, 1995).

The child welfare profession has an ethical responsibility to use decision making tools that promote accurate and equitable protective decisions for maltreated children and their families. Further, because of the potentially devastating consequences of bad decisions, we must assure that our decision making tools have the most rigorous scientific support possible (65). This adherence to a more standardized and rigorous approach to decision making is consistent with the child welfare field's recent commitment to evidence-based practice. Not only must we seek strong empirical support for our activities and interventions, but we must apply this "evidence" in structured and systematic ways to assure that the most relevant and appropriate decisions are made using this information.

Decision theory provides a conceptual framework and a variety of reliable, valid, and easy-to-implement technologies that can help child welfare practitioners make effective decisions in a variety of decision making contexts and environments. This article introduces some of the fundamental constructs of

decision theory and describes how these can be used in the development of instruments and protocols to guide critical child welfare decisions. Research will be reviewed that demonstrates the validity of protocols developed in accordance with tenets of decision theory. Finally, recommendations will be offered for a concise, logical framework for improved decision making in child welfare.

Decision Theory - Tenets and Models

Decision theory can be defined as "a body of knowledge and related analytical techniques of different degrees of formality designed to help a decision maker choose among a set of alternatives in light of their possible consequences" (Web Dictionary of Cybernetics and Systems, 2004). Tenets of decision theory form the foundation of economic theory and have also profoundly influenced other disciplines such as psychology, philosophy, evolutionary biology, and political science.

To be precise, decision theory is not a single theory. Rather, it is an amalgam of constructs, technologies, and decision-making models designed to maximize utility while concurrently minimizing risk. Decision theory attempts to reduce uncertainty in decision making by establishing priorities, increasing consistency and accuracy, and optimizing the use of resources. These objectives are all critical to child welfare decision making. It is therefore not surprising that many of the decision-making models that emanate from decision theory can be easily applied to child welfare decisions.

Many of life's most important decisions require an ability to analyze, weigh, and synthesize a large body of information, and to use this information to guide actions toward achievement of a predetermined goal. Some decisions require an estimation of the likelihood of a future event. These can vary in both importance and complexity from estimating the probability of rain (to decide whether to carry an umbrella), to estimating the probability of future serious illness (to decide whether to undertake preventive medical measures). Further, the degree of certainty in the environment in which the decision is made can vary dramatically from substantially certain, to probable, to equivocal, to completely uncertain. Complex decisions are made even more complex when the decision

making environment is highly uncertain – that is, when essential information is unavailable or of questionable accuracy; when the decision maker has little knowledge about the topic being considered; or when there is insufficient time to fully analyze and assimilate the variables to be considered. Clearly, the higher the degree of uncertainty, the greater the potential for error.

Child welfare decisions are inherently complex, largely because so little is certain about human behavior. This is especially evident when assessing child safety, which requires identifying the unique contributors to child maltreatment in a family and the contribution of factors in the physical and social environments, as well as the impact of strengths or protective factors in mitigating maltreatment. Moreover, in child welfare, the decision-making environment is frequently enigmatic and opaque, since vital information may not be readily available, and decisions must often be made in truncated time frames. Child welfare decisions, especially those requiring estimates of the likelihood of future maltreatment, are rarely certain. Yet, when children's safety and well being are in question, we are compelled to strive for the greatest degree of certainty possible when making decisions, and we need decision making strategies and tools that increase both the reliability (consistency) and validity (accuracy) of these decisions.

The complexity and uncertainty that characterize child welfare decisions compel us to seek the clarity, simplicity, and utility of well-designed decision protocols. Decision theory can provide technologies and tools to help accomplish this. While the constructs of decision theory are often complex, protocols based on its tenets are generally conceptually simple and often elegant.

In an essay on the technology of decision making, Dawes (1993) references the need to "break down a problem into its components" to enhance the effectiveness of decisions. This recommendation is central to improving decision making in child welfare. Making decisions to assure children's safety and well being is an iterative process, requiring a series of separate assessments and actions, often in a prescribed order, throughout the life of the case. Consider, for example, the decisions that must be made during the first few days and weeks following receipt of a report of child maltreatment. Should the agency accept a referral for investigation or divert the family to other community providers? How quickly must the agency respond to the referral? Are any of the children

currently unsafe and in need of immediate protection? Can a child be left in the home while the investigating worker gathers more complete information? What immediate interventions are necessary to protect the child? Does a child need to be placed into substitute care to assure his/her safety? What is the likelihood that the child will be harmed in the future? Should the case be opened for ongoing services? What kind of services will be necessary to promote safety, assure the child a permanent family, and promote the child's well being?

While all decisions must be based on the most relevant and critical information available, it must also be recognized that the accuracy of any decision will be impacted by the amount of information that can be reliably gathered at each decision point. For example, what is known from an initial phone referral will be less than what is known after completion of an on-site assessment, and both will provide less information than a thorough investigation. Yet, each decision must be as accurate as possible, and must be made in a timely and efficient manner. There are obvious benefits to decision making tools that prioritize collection of the most essential and most available information for the decision at hand; that structures the collection and analysis of this information; and that guides the decision maker to a presumptive decision. In essence, an overarching goal of child safety is achieved by implementing a structured series of sub-decisions, each one appropriate for a particular stage in the case history, which when taken together, comprise a decision-making strategy to provide the best possible safety decisions for a child through the life of the case.

Decision theory addresses a second but related issue. In child welfare, as in other human service disciplines, there is a natural tendency to gather as much information as possible about a family, an individual, or an event. However, too much data can itself create an information overload that reduces both the efficiency and quality of decisions. Proponents of decision theory divide data into two categories, "information" and "noise." Information reduces uncertainty; noise is superfluous information not directly relevant to the problem being addressed. When noise is mistaken for relevant information, it supports ineffective and inappropriate decisions. The most problematic "noise" is that which appears intuitively relevant, but which does not substantially affect the decision-making process. Decision theory uses research to isolate and quantify the type of information that is most relevant to a particular decision,

and then incorporates only the most relevant information into the decision-making model, essentially separating information from noise. Resulting decision making protocols focus attention on only those factors with the greatest relevance to the circumstances being assessed. This not only enhances the quality of the decision, but often reduces the amount of time necessary to reach it.

In spite of the apparent value of decision theory for the child welfare field, its use may meet with considerable resistance. At first glance, decision theory and social work could appear incompatible. Decision theory is most often expressed in the language of mathematics, using terms such as probability, odds ratios, and decision trees. Nothing appears more antithetical to many social workers than the impersonal nature of these constructs. Social workers are taught to work within the context of an established interpersonal relationship, to take a humanistic view of issues, to consider all perspectives equally, and to individualize their approaches to each family. Social work typically focuses on individual entities – a child, a family, an organization – while decision theory focuses on the collective, drawing inferences for the individual from the combined experiences of many. Further, some practitioners equate any form of standardization as a rigid mandate that undermines individuality, responsiveness to clients, and creative use of "self" in addressing client needs and problems (Rycus & Hughes, 2003). Training and supervisory support will be necessary to help staff understand that using standardized protocols in no way undermines the social work values and methods, and in fact, will support fundamental social work values by promoting equity and justice to families by making good decisions.

Defining Decision Making "Models"

Decision making models are formal frameworks designed to help promote decisions that achieve predetermined objectives. Effective decision-making models and tools not only guide the decision maker in gathering the most relevant information, but in many cases, the tools also direct and standardize the methodology for analyzing and synthesizing the information to promote the

most appropriate conclusions from the analysis Decision-making models structure the steps in the decision making process in the following manner:

- 1) They formalize the collection, recording, and analysis of specific information that is most relevant to the decision at hand by incorporating predetermined and carefully defined questions, items, or measures in the protocol;
- 2) They often structure the sequence in which the information should be considered, thereby promoting the most logical analysis and synthesis of the information;
- 3) They may assign a level of priority or a weight to each piece of information, based on the relative importance of the information to the desired conclusion or decision; and,
- 4) They guide the decision-maker to arrive at the most accurate and relevant conclusion based on the answers or responses to the questions or items in the model.

Good decision-making models must have certain characteristics. First, they must be easy to understand and to use without oversimplifying either the criteria or the methods of analysis to the point that conclusions are either inaccurate or ambiguous. Second, the questions, criteria, or measures in a tool must be defined clearly enough to be recognized and understood by a variety of users, thereby promoting consistency (sometimes referred to as inter-rater reliability) in the use of the protocol. Third, the criteria or items in a model must actually measure what they are intended to measure. There must be a relationship of each measure to the specific outcome we are seeking to impact. Tools must be subjected to scientific assessment to establish their reliability and validity, thus assuring they perform in the intended manner. Finally, the type of tool must always be appropriate to achieve the tool's stated objective. Thus, as the decision-making goal or objective changes, both the criteria incorporated in the tool and the methodology needed to arrive at a decision may also change.

Two decision-making models are particularly useful in structuring decisions related to child safety. One model is called a decision tree. A decision tree provides a logical framework for decision making by identifying, articulating, and prioritizing very specific criteria needed to reach a decision, and then sequencing the assessment of these criteria in a predetermined order. In its most basic form, the criteria in a decision tree are presented as questions that can be answered either "yes" or "no." Depending on the answer, the decision maker is directed to consider the next relevant question, until, at the end of a line of inquiry (i.e. the end of a "branch" of the tree), a specific presumptive decision is provided. Decision tree technology forms the framework for two types of safety-related decisions; establishing priorities for agency response at the time of referral, and assessing child safety.

A second type of tool, sometimes referred to as an additive index, is better suited to translate research results into simple decision tools. One application of this technology is an actuarial risk assessment, in which the decision maker must assign a level of potential risk to families based on the likelihood of a future occurrence of child maltreatment in the family. Actuarial risk assessments are based on rigorous, structured research that establishes statistical associations between certain predetermined criteria and a specific outcome of interest – in this case, the probability of future maltreatment. The characteristics of actuarial risk assessment are described more fully below.

These decision making tools exemplify several concepts of decision theory. The "child safety decision" is broken down into its component parts, specifying what decisions must be made at each stage of intervention, and applying criteria and models that are most appropriate for each individual decision. By simplifying and structuring the decision making process, these tools also increase both effectiveness and efficiency by helping to eliminate "noise" and enhance the consistency (i.e. reliability) of the resulting decisions.

APPLYING DECISION MAKING MODELS TO CHILD SAFETY

Child safety, the underlying purpose of child protective services, must be assured throughout the life of each case. This requires continuous and vigilant

attention to identifying circumstances that place children at high risk of maltreatment, and acting in ways to reduce this risk while simultaneously promoting permanence and well being. However, as indicated earlier, the specific approach to assuring child safety will differ depending on the particular stage of intervention and the nature of the task at hand. For example, identifying children at risk of imminent harm requires a different scope and type of information than that needed to choose the most relevant services to strengthen a family and prevent future maltreatment.

To improve the accuracy and relevance of each decision on the child safety continuum, four steps must be implemented when developing decision-making systems and protocols. They are:

- Identify precisely what problem needs to be addressed at each decision point in the continuum, and specify what decision must be made to effectively resolve this problem (examples are, whether and how quickly the agency should investigate a referral; whether a child can remain safely at home while the investigation proceeds; or what services to provide to reduce the likelihood of future harm;)
- Determine the type, scope, and depth of information that is most relevant and most critical to each decision on the continuum;
- Determine what information is most likely to be available or can be reliably obtained at each decision point, considering the length of agency involvement and the number and extent of case and collateral contacts;
- Determine the stakes involved, the barriers that increase the potential for error, and the possible consequences of error.

This process can be used to develop three decision-making protocols to guide decisions related to child safety. They are:

- 1) A priority response tool, which uses a decision tree model to screen referrals at intake, and to determine which children appear to be at

- sufficient risk of imminent harm to warrant an immediate, face-to-face contact with an investigation caseworker;
- 2) A safety assessment protocol, using a modified decision tree model, to confirm whether a child is currently unsafe or is likely to sustain harm in the imminent future; and, to guide actions to assure the child's protection while a more thorough assessment is completed; and,
 - 3) An actuarial risk assessment tool, which estimates the probability of future maltreatment and categorizes families into groups by risk level, to inform case disposition decisions – that is, whether to open a case for child protective services, to refer a family to other providers for case management and supportive social services, or to close the referral at the intake level.

All three decisions have a significant impact on children's safety, albeit at different times in the case planning process and with different purposes. The tools to guide these decisions incorporate different criteria and measures, and require different technologies of information assessment and synthesis. Other tools will be needed later in the case process to gather assessment data for service planning purposes, to reassess risk, and to guide reunification planning. Because of space limitations, we will focus here on the three tools described above. These tools are more fully described below, followed by a review of the research that has established their validity and effectiveness in achieving their intended purpose.

Priority Response

The first point at which child safety is addressed is at the time of intake, when an allegation of child maltreatment is received. The criteria used to establish response times should be based on a few essential facts that can be reliably obtained without a face-to-face contact. The goal should be a simple, straightforward approach that promotes consistency and accuracy in making intake decisions.

An example of a response priority decision system to evaluate physical abuse is shown below (see Figure 1). This tool “decision tree” approach incorporates and prioritizes critical risk factors to be considered in the proper order to lead the decision maker directly to a presumptive decision regarding the speed of the response.

(Insert Figure 1, Physical Abuse)

As the example illustrates, the speed of agency response to an allegation of physical abuse depends on the seriousness of the alleged maltreatment and the level of vulnerability of the child. Each type of allegation (abuse, neglect, medical neglect, sexual abuse) uses a different set of criteria to determine a presumptive course of action. Although additional information would certainly be useful, agencies are generally constrained by how little reliable information can be obtained from a phone conversation with the person making the referral.

Research on Priority Response Tools

If the response times established by these protocols are appropriate, research should be able to demonstrate a strong relationship between the identified response priority and both subsequent assessments of safety and agency actions taken to ensure safety. In other words, a far higher proportion of cases identified by the response priority tool as needing an immediate response should: 1) have safety factors identified during the intake assessment/ investigation, and/or 2) have children removed from their homes to assure their protection at the time of intake. Tracking these relationships over time provides measures of concurrent validity for the priority response tool, and also gives agencies data to identify and correct weaknesses in the system.

Data are available from a wide variety of agencies across the nation using structured response priority tools. The priority ratings assigned to reports of abuse/neglect were highly correlated with safety issues identified at the first face-to-face contact. (Baird, 2004). Figure 2 further delineates this relationship.

(Insert Figure 2, Relationship Between Response Priority and Safety Assessment)

Safety Assessment

One of the most critical decisions facing intake caseworkers is how to recognize and protect children at high risk of imminent maltreatment when very little is known about the child and family. This decision usually involves considering whether to leave children at home while conducting further assessment and service planning. The "place or not place" decision has major implications not only for children's safety, but also for the long-term detrimental consequences of traumatic separation on children's development, family functioning, and agency liability and credibility. In 1996, a major study by Rossi and colleagues found little agreement among child welfare workers or experts about the specific conditions that warranted removal of a child from the home. They concluded, "a family's chances of having a child taken into custody varies widely according to the person who is assigned to investigate that case (Rossi, et. al., 1996)."

This challenge prompted the development of a variety of decision-making protocols, called "safety assessments," to standardize the collection of information and to help workers balance the potential for imminent harm against the availability of factors to mitigate such harm. These safety assessment tools were intended to guide decisions to protect children in the least traumatic, least intrusive manner possible (DePanfilis & Scannapieco, 1994). A modified decision-tree format is generally used to guide this decision process.

Items on safety assessments routinely probe for information about existing unsafe environmental conditions, a recent history of serious maltreatment, negligent or abusive parenting practices, and family or environmental conditions that currently compromise a child's health or well being. Identifying the presence of any one of these conditions is sufficient to register a potential safety concern. The decision tree model, in effect, directs the assessor to consider three standardized questions, in the following order, to reach a decision about whether the child can be protected at home, or will need to be removed and placed to assure their safety.

The first question is, "Does the identified condition represent a high likelihood of serious harm, either currently or in the immediate future?" If the answer is yes, indicating there is a high potential for serious imminent harm, the agency has two choices – but "not acting" is not one of them.

One option is to protect the child at home; the second is to protect the child through out-of-home placement. To make this decision, a second question must be asked; "Do protective factors exist in the family, extended family, and immediate environment that could mitigate the safety concerns and reduce the safety threat?" If sufficient protective factors can be identified and mobilized to protect the child at home, the trauma of out-of-home care can be prevented, often without extensive or costly agency intervention. However, if the answer is "no," indicating that sufficient protective factors do not exist within the family system, the worker must ask, "Can the agency apply interventions that can protect the child at home while the investigation and assessment can be completed?" Such interventions might include homemaker services, protective day care, crisis intervention, and other concrete services to stabilize family situations. If agency interventions cannot protect the child, then the final option, removal and placement, is considered.

By standardizing these questions in the proper sequence, the decision to remove and place a child in out-of-home care is made only after the child has clearly been identified as "unsafe," and all other options to protect the child at home have been exhausted. Thus, structuring the assessment process in a predetermined order helps establish safeguards that help deter inappropriate placement decisions.

Information gathered during safety assessments is typically formalized into safety plans, which guide casework activities during the initial phases of case contact until a more in-depth assessment and individualized service plan can be completed.

Research on Safety Assessment

The most extensive studies of safety assessment have been conducted in Illinois (Fluke, Edwards, Bussey, Wells, and Johnson, 2001; Fuller, Wells, and Cotton,

2001) and in Michigan (Wagner, Johnson, and Caskey, 1999). Both Illinois studies analyzed the impact of a safety protocol, the Child Endangerment Risk Assessment Protocol (CERAP) on child safety. The second study of CERAP also attempted to measure the relationship between individual safety factors and case outcomes. The CERAP studies were important because researchers did observe a significant reduction in short-term recurrence of child maltreatment when the CERAP had been implemented. While the researchers could not state with certainty that this reduction was due to use of the safety assessment, this finding remains positive. Less success was attained in establishing relationships between individual safety factors in the protocol and maltreatment recurrence. Because safety assessments typically gauge whether children may be harmed in the imminent future (generally within the 30-day time frame allocated for most investigations), safety assessment research is compromised by the typically low rates of recurrence within this short a time period. Recurrence rates are further reduced by the fact that many children judged to be “unsafe” are removed from their homes, often for the entire follow-up period.

The Michigan research did establish some significant relationships between individual safety factors and recurrence of maltreatment, but the follow-up analysis period was expanded to six months before these relationships proved significant.

Large databases from several states also provide other means of judging the efficacy of safety assessments. Safety assessments have demonstrated reasonably high correlations with valid risk assessment instruments as well as response priority tools, and these, at least, provide a measure of concurrent validity (Baird, 2004).

Risk Assessment

The unique role of risk assessment in the larger context of child protection is to classify families accurately into groups based on their likelihood of future maltreatment, thereby enabling agencies to decide which families to serve and monitor within the child protection system. This allows agencies to divert families with low probability of future maltreatment to other community

providers, and to target the most intensive services to the children and families most likely to experience maltreatment.

The benefit of applying actuarial technologies to risk assessment is that it promotes greater consistency and accuracy of these assessments, and hence, greater fairness to families. Because actuarial decision-making models use standardized statistical procedures to identify the specific criteria, and their combined effects, that have the greatest power to discriminate between groups of people regarding the future occurrence of a particular outcome, actuarial risk assessments typically have a higher degree of both reliability and validity than consensus-based or matrix tools (Baird & Wagner, 2000).

In contrast to safety assessment, for which research data is limited, a great deal is known about the efficacy of risk assessment, particularly actuarial risk assessment protocols. For example, in the past two decades, the Children's Research Center of the National Council of Crime and Delinquency has conducted 16 individual studies to develop and revalidate actuarial risk assessment tools for child welfare (Baird, 2004). Additional comprehensive validation studies of actuarial risk assessment instruments have been completed in California and New York (Johnson, 2004; Mitchell-Herzfeld & Ruppel, 2004). The data from these studies represent more than 38,000 families from 13 widely dispersed geographic areas. In most of these studies, samples were selected from cases that had been previously investigated for abuse and neglect, regardless of whether they had been substantiated. Follow-up periods ranged from 12 to 24 months. Six of these studies, including the two largest, were prospective validation studies. The availability of computerized databases has facilitated the use of very large samples in these studies, further strengthening confidence in the study conclusions.

When data from all these studies are combined, they demonstrate the effectiveness of actuarial risk assessment models in correctly estimating three different outcomes in child welfare populations: the likelihood of a future recurrence of child maltreatment, the likelihood of serious injury to a child, and the likelihood of out-of-home placement (Baird, 2004). This research has demonstrated that families rated at moderate risk are about twice as likely as low risk families to maltreat their children; high risk families are four times more

likely to maltreat their children when compared to low risk families; and families rated very high risk are seven times as likely as low risk families to maltreat their children. The capacity of these instruments to discriminate among families on outcomes of child injury and out-of-home placement exceeds the level attained for general recurrence of child maltreatment (Baird, 2004).

Recent studies have also demonstrated that actuarial instruments used in child welfare are quite robust: they perform as well or nearly as well when applied to populations other than the sample population on which they were developed (i.e. the construction sample.) Well-validated risk assessment instruments have also proved to be transferable among jurisdictions – actuarial risk assessments developed in Michigan and California have been found to provide valid estimates of risk in several other jurisdictions as well (Baird and Wagner 2000).

Validity also appears to remain intact over time. The risk assessment instrument developed on a population randomly sampled from seven California counties in 1995 performed about as well on an investigation cohort of cases from 2001 (Wagner & Johnson, 2003). Similar instruments used in the field of corrections have been found to remain valid over a span of nearly three decades (Wagner, Quigley, & Ehrlich, 1998).

Still, continuing research, particularly revalidation research, can improve the validity of these instruments even further. In New York, a revalidation study led to revisions in the protocol that produced a higher level of discrimination than that produced by the 1997 study (Mitchell-Herzfeld & Ruppel, 2004).

Risk Assessment and Federal Performance Outcomes

Under federal child safety outcome requirements, states are expected to reduce the rate of maltreatment recurrence to 6.1% or less at six months from the date of the initial substantiation, measured by numbers of new substantiated reports. To comply with these standards, it would be helpful if states could identify families at the highest risk of maltreating a child within the six-month time frame. The following graph (See Figure 3) illustrates that actuarial risk assessment provides such capability (Johnson 2004).

(Insert Figure 3 - Substantiated Maltreatment Recurrence within Six Months of Initial Referral in California)

Johnson (2004) found that families at the two lowest risk levels had recurrence rates below the 6.1% federal threshold, even without CPS intervention, while families ranked high and very high risk had recurrence rates that were substantially higher than 6.1%. Successful intervention with the higher risk families could, therefore, help agencies meet the federal standards. Such findings have profound implications for targeting services to higher risk cases.

Promoting Equity in Risk Assessment

A frequently heard and sometimes legitimate criticism of risk assessment protocols is that they promote bias in child welfare decisions. Given the level of disproportionate representation of African American and other children of color in the nation's child welfare system, it is incumbent on agencies to ensure that their decision making systems are free from ethnic and racial bias. Thus, all assessment protocols must be tested for equity.

Criteria developed by the American Educational Research Association can be used to judge the equity of assessment procedures. They suggest that equity is attained when:

“Examinees of equal standing with respect to the construct the test is intended to measure should, on average, earn the same test score, irrespective of group membership” (American Psychological Association, American Educational Research Association, National Council on Measurements in Education, 1999).

When applied to risk assessment, this means that maltreatment recurrence rates observed at each level of risk (very high, high, moderate, low) should be approximately the same for each racial and ethnic group served in the CPS

population. Agencies must avoid situations where, for example, African American families are rated to be high risk when they have recurrence rates similar to other racial groups who are rated as moderate risk. Such a circumstance can lead to differential treatment of groups whose actual probability of continued maltreatment is, in fact, essentially equal. Moreover, if recurrence rates are approximately equal across racial and ethnic groups, agencies should expect approximately equal proportions of each group to be classified in each risk level.

Because actuarial systems are based on research, it is easy to evaluate the equity of these protocols during their development. Unfortunately, few consensus-based systems have been tested for their capacity to assure equity. Wherever study sample size permits, all risk assessment models should be independently tested on each racial and ethnic group in the construction sample. This helps determine if there are significant differences among subgroups in recurrence rates at each risk level, and also allows developers to make adjustments in the instrument's items, item weights, or cut-off scores in order to achieve equity. The level of equity actually attained by the instrument can then be validated using a prospective evaluation on a different data set. An example of this process being applied can be seen in California, where a comprehensive evaluation of that state's actuarial risk assessment concluded the following:

“Collectively, the findings reported here support two hypotheses: 1) That the California Family Risk Assessment (CFRA) is a fair and equitable means of assessing the likelihood of future maltreatment when used with major U.S. population subgroups – African Americans, Hispanics, and Whites, and 2) That use of the CFRA will reduce disproportionate representation of minorities including African Americans relative to Whites in the child welfare population” (Johnson, 2004).

The state of Michigan also applied these equity measures to their actuarial risk assessment. Table 1 presents data illustrating that nearly equal proportions of African Americans and Whites are classified at each level of risk. Data presented in Table 2 more directly addresses the equity criterion listed above: there were

no significant differences in subsequent rates of substantiation between African Americans and Whites at each risk level in Michigan (Baird & Wagner, 2004).

Table 1		
Michigan		
Percentage of Families at Each Risk Level		
Risk Level	Whites (N = 6,651)	African Americans (N = 5,296)
Low	10.5%	11.3%
Moderate	30.7%	30.0%
High	45.1%	46.0%
Very High	13.7%	12.7%

Source: Michigan Family Independent Agency

Table 2		
Michigan		
Substantiation Rates at 12 Months		
(by Race)		
1995		
Risk Level	African Americans	Whites
Low/Moderate*	6.0%	5.0%
High	15.0%	12.0%
Very High	28.0%	30.0%

* Because of the small number of cases rated low risk (when the sample is divided by race), the low and moderate risk categories have been combined.

Safety Assessment and Risk Assessment: A Note of Caution

There are proponents who maintain that safety assessment is the "instrument of choice" in assuring child safety, even to the point of excluding risk assessment

and other decision making protocols. However, research has demonstrated that safety assessment technology is limited in its utility, and there is little evidence that safety assessments alone can effectively gauge the potential for harm over a more protracted future (Johnson, 2004; Baird, 2004). Data also indicate that even when the follow-up period is limited to 30 days, risk assessment actually outperforms safety assessment in identifying families most likely to maltreat their children (Baird, 2004). Thus, when safety assessment is used to identify more than imminent harm, it is venturing into an arena better left to risk assessment. With considerable available research demonstrating that actuarial risk assessment effectively identifies families where children are most at risk of future serious harm (and future placement), utilizing safety assessment beyond this limited purpose seems an unwise proposition. Still, safety assessment plays a vital part in CPS decision making, and when combined with response priority, risk assessment, family assessment for service planning, and reassessment protocols, it completes a comprehensive system that can help attain child safety at all decision points and contribute to preventing subsequent maltreatment of children.

Utilizing decision theory and the existing safety and risk assessment research, we make the following recommendations for evidence-based decision making in child protective services.

1. Decision-making protocols should be as concise and easy to implement as possible.
2. Decision-making tools should include only those criteria that can be assessed with some degree of reliability and accuracy at the point in time each decision is made, and these criteria should relate specifically to the decision at hand.
3. Decision tools and their criteria should be clearly articulated to promote understanding not only by the staff who must use them, but also by the judiciary, other professional partnering organizations, and the community at large.

4. Decision-making tools should lead directly to presumptive decisions. This requires the structure of an additive index, a decision tree or, at a minimum, clearly delineated rules on the role of each factor in reaching each decision.
5. Decision tools, regardless of their type (research based, consensus based, or clinically based) should be tested for reliability, equity, and efficacy. Evidence regarding the effectiveness of each decision tool should be routinely collected, analyzed, and reported back to staff and administrators.
6. Neither safety assessment nor risk assessment alone can provide sufficient information on which to make effective safety decisions for children. Both are essential components of a comprehensive decision-making system for child welfare.
7. Actuarial risk assessments do not have to be lengthy to be valid. Generally, accurate estimates of risk can be attained by combining ratings from 9 – 12 items, selected on the basis of research specifically designed for the purpose of instrument development.
8. Risk of abuse and neglect are best assessed separately. Although some measures of past behavior and some family characteristics relate to both types of maltreatment, there are also different family dynamics that relate to each.
9. Overrides to decision-making tools can be allowed, but the reasons for these should be clearly articulated and documented, approved by a supervisor, and monitored to determine their accuracy over the longer term.
- 10) Finally, the child protection field must recognize it is not enough to simply identify factors that have a demonstrated relationship to risk and allow these factors to be applied in different ways by different staff members at each decision point. A high level of *structure* is required to

ensure that staff make consistent and appropriate decisions to expedite the safety and well being of children.

Conclusions

Combining the basic tenets of decision theory with what is known about CPS assessments and child safety creates an excellent framework for case decision making. Assessing child safety throughout the life of a case is an iterative process. Decisions should be based on what information is essential at each decision point and what can be reliably gathered at that point. What can and should be considered when a referral is received is different from what can be assessed when a worker actually arrives on site. This, in turn, is far less than what is known at the end of an investigation and development of a social history. Each decision must be made in a manner to ensure that agencies use their resources most effectively to protect children. The key to improving child welfare is the development and use of a logical framework for decision making followed up with continuing research to validate and further refine the structure and tools that can best help us achieve our outcomes.

References

- Altman, D.G., & P. Royston. (2000). What do we mean by validating a prognostic model? *Statistics in Medicine*, 19, 453-473.
- American Psychological Association, American Educational Research Association, National Council on Measurements in Education. (1999) *Educational and Psychological Testing*. Washington, DC: Author.
- Baird, C. (2004). *Risk assessment and decision making in child welfare services*. Madison, WI: National Council on Crime and Delinquency.
- Baird, C. and D. Wagner. (2004). Using research-based risk assessment to increase equity in child protective services. *Race Matters*. Champaign, IL: University of Illinois Press (in press).
- Baird, C., Wagner, D., Healy, T., & Johnson, K. (1999). Risk assessment in child protective services: Consensus and actuarial model reliability. *Child Welfare*, LXXVIII (6), Nov-Dec.

- Baird, S.C., & D. Wagner. (2000). The relative validity of actuarial- and consensus-based risk assessment systems. *Children and Youth Services Review*, 22(11/12), 839-871.
- Burgess, E.W. (1928). Factors determining the success or failure on parole, in A.A. Bruce (Ed.), *The workings of the indeterminate sentence law and the parole system in Illinois*, Illinois committee on indeterminate-sentence law and parole, Springfield, IL, 205-209.
- Cicchinelli, L. F. & Keller, R.A. (1990). *A comparative analysis of risk assessment models and systems: Final report*. Grant No. 90-CA-1302. Lakewood, Co: Applied Research Associates, June.
- Cicchinelli, L. F. (1995). Risk assessment: Expectations and realities. *The APSAC Advisor, Special Issue on Risk Assessment*. 8(4), Winter.
- Curran, T. F. (1995). Legal issues in the use of CPS risk assessment instruments. *The APSAC Advisor, Special Issue on Risk Assessment*, 8(4), Winter.
- Dawes, R. (1993). Finding guidelines for tough decisions. *The Chronicle of Higher Education*, June 9, A40.
- DePanfilis, D. (1996). Implementing child maltreatment risk assessment systems: Lessons from theory. *Administration in Social Work*, 20(2).
- DePanfilis, D., & Scannapieco, M. (1994). Assessing the safety of children at risk of maltreatment: Decision-making models. *Child Welfare*, LXXIII(3), May-June.
- English, D. & Pecora, P. (1994). Risk assessment as a practice method in child protective services. *Child Welfare*, LXXIII(5), Sep-Oct.
- Fluke, J., Edwards, M., Bussey, M., Wells, S., & Johnson, W. (2001, August). Reducing recurrence in child protective services: Impact of a targeted safety protocol. *Child Maltreatment*, 6(3).
- Fuller, T., Wells, S., & Cotton, E., (2001). Predictors of maltreatment recurrence at two milestones in the life of a case. *Children and Youth Services Review*, Vol. 23(1), 49-78.
- Gambrill, Eileen & Aron Shlonsky (2001). The need for comprehensive risk management systems in child welfare. *Children and Youth Services Review*, 23(1).
- Gambrill, E. & Shlonsky, A. (2000). Risk assessment in context. *Children and Youth Services Review*, 22(11-12).
- Grove, W.M., & Meehl, P.E., (1996). Comparative efficiency of informal (subjective, impressionistic) and formal (mechanical, algorithmic) prediction procedures: the clinical-statistical controversy. *Psychology, Public Policy, and Law*, 2(2), 293-323.

- Johnson, K., & Wagner, D., (2003, September). California structured decision making™ risk assessment revalidation: A prospective study, Children's Research Center, Madison, WI.
- Johnson, K., Ereth, J., & Wagner, D., (2003, January). New Mexico Children Youth and Families Department Protective Services Division: Risk assessment revalidation study, Children's Research Center, Madison, WI.
- Johnson, W. (1996). Risk assessment research: Progress and future directions. *Protecting Children, 12(2)*.
- Johnson, W. (2004, February). Effectiveness of California's child welfare structured decision making™ (SDM) model: A prospective study of the validity of the California family risk assessment, California Department of Social Services.
- Lyons, P., Doueck, H.J., & Wodarski, J.S. (1996). Risk assessment for child protective services: A review of the empirical literature on instrument performance. *Social Work Research, 20(3)*.
- Macdonald, G. (2001). *Effective interventions for child abuse and neglect: An evidence-based approach to planning and evaluating interventions*. Chapter 14: Risk assessment and decision making. Chichester, UK: John Wiley & Sons, Ltd.
- McDonald, T. P. & Marks, J. (1991). A review of risk factors assessed in child protective services. *Social Services Review, 65*.
- Mitchell-Herzfeld, S. and Ruppel, J. (2004). *New york state risk profile study*. Albany, NY: New York State Office of Children and Family Services (in press).
- National Research Council's Committee on Risk Perception and Communication. (1989). *Improving Risk Communication*.
- Pecora, P.J., Whittaker, J.K., Maluccio, A.N., & Barth, R.P. (2000). *The child welfare challenge: Policy, practice, and research*. Second Edition. New York: Aldine De Gruyter.
- Rossi, P., Schuerman, J., & Budde, S. (1996). *Understanding child maltreatment decisions and those who make them*. Chicago, IL: University of Chicago, Chapin Hall Center for Children.
- Ruscio, J. (1998). Information integration in child welfare cases: An introduction to statistical decision making. *Child Maltreatment, 3(2)*, May.
- Ruscio, J. (1998, May). Information integration in child welfare cases: an introduction to statistical decision making. *Child Maltreatment, 3(2)*, 143-156.

- Rycus, J. S., & Hughes, R.C. (2003). *Issues in Risk Assessment in Child Protective Services*. Columbus, OH: North American Resource Center for Child Welfare, Center for Child Welfare Policy.
- Silver, E., & Banks, S., (1998). Calibrating the potency of violence risk classification models: the dispersion index for risk (DIFR). Paper presented at the American Society of Criminology conference.
- Silverstein, M.J., & Lagios, M.D., (1997, March). Use of predictors of recurrence to plan therapy for DCIS of the breast. *Oncology*, 2(3), 393-410.
- Wagner, D., Quigley, PI, & Ehrlich, J.(1998). *Risk assessment findings: Nevada probation and parole*. Madison, WI: National Council on Crime and Delinquency.
- Web Dictionary of Cybernetics and Systems (2004). Principia Cybernetica Web:
http://pespmc1.vub.ac.be/ASC/DECISI_THEOR.html