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# REASONING SCHEMES, EXPERT OPINION AND CRITICAL QUESTIONS. SEX OFFENDERS CASE STUDY

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## Abstract

This paper examines in detail the argumentation features in the domain of sex offender with some applications to the scheme of "Argument from Expert Opinion". We build a model for reasoning schemes, critical questions and expert opinion on the question of "the degree of risk of a sex offender". We discover that in order to properly model expert practice in this area we need to use numerical argumentation as well as the new notion of "Attack as Information Input". The model is generic and we believe is not restricted to the sex offence area of expertise.

Our paper also offers a more detailed example for Walton's argumentation scheme of Expert Opinion as well as a bridge between the argumentation community and the community dealing with sex offenders. We offer an introduction to the student on the subject of determining the degree of risk of sex offenders. We also look at standard international tools for determining the risk of sex offenders and see how the argumentation community can integrate these tools.

## 1 Background and Orientation

This paper is the first of a series of papers (see also our paper [33] on Universal Distortion) dealing with Argumentation, Logic and Sex Offenders (ALSO), a topic which lies in the borderline of three vibrant communities:

1. The community of therapists, psychologists and experts involved in dealing with sex offenders. This is an important community involved both in the medical, social and legal aspects of sex offenders. You have such people in every large community in every country and on their expertise hangs the freedom/health/suffering of many people. This community uses logic and argumentation not only in their interaction with the courts of law but also in their therapy methods( although they are not fully aware of the formal aspects of what they are doing).
2. The old established community of debate/ dialogue/arguments/fallacies. This community is today, let us say, associated with say the Springer journal entitled: Argumentation – An International Journal on Reasoning and the Amsterdam ISSA-conferences, the latest being [http://cf.hum.uva.nl/issa/conference\\_2014.html](http://cf.hum.uva.nl/issa/conference_2014.html).
3. The computational argumentation community, associated with the COMMA conferences <http://www.ling.uni-potsdam.de/comma2016/> and the Journal *Argument and Computation*.

There is some communication between the communities 2. and 3., but no awareness between communities 1. and {2,3}. Communities 2. and 3. connect with the general logic community. Community 3. is a younger community and do not seem to fully appreciate, (in my opinion, D.G.) the enormous contribution of community 2.

We see the value of this paper as connecting between the communities 1. and {2,3}, and between communities 2. and 3. internally. The benefits we envisage for the communities involves are we hope as follows:

1. The sex offender community use logic and argumentation extensively without being aware of it as such. By coming together and observing the practice of the sex offender community, the argumentation communities can get ideas for new models of argumentation, rooted in actual practice. This can lead to further development of logic and argumentation. In our humble opinion, the situation is analogous to observing the flow of water in pipes and developing new turbulence differential equations as a result.
2. The numerical tools and models used by the sex offenders community, when put in formal forms and in the abstract language of the argumentation communities, look very simple and the argumentation community can develop better tools for the sex offender community.

The structure of our program, of which this paper is a modest beginning, is very simple, using a repeated iteration of Steps 1–8 below:

Step 1. Start with the first iteration of our approach with an initial package of logical tools, which in this initial paper is comprised of reasoning schemes, critical questions and Walton argumentation scheme for Expert testimony. This package is familiar to community 2. and is also being recently studied in community 3.

Step 2. See how this is practiced in community 1. Get new ideas how to improve the package.

Step 3. Export the initial results back to community 2.

Step 4. Try to express what you see in community 1, using methods of community 3.

Step 5. Discover that community 3 needs to sharpen and extend their formal logic and argumentation tools.

Step 6. Export the new tools to discuss issues in community 2.

Step 7. Try to interest community 1 and offer community 1 better tools.

Step 8. Go to Step 1 and start the process again, with the new package of tools you accumulated along the way in the previous iteration.

We put emphasis in informing communities 2. and 3. on how community 1. works. So we give a lot of details about the processes of community 1. This is a natural flow of information. The findings about how the therapists work are surprising. They actually use logic without explicitly being aware of it. See [33]. So the benefit to argumentation, communities 2 and 3 is further development of ideas and tools. How to inform and interest community 1. in argumentation is another problem. We need to show them the benefit of formal modelling, but for that we need to develop tools. Remember community 1 are therapist, they want to see results! It is a challenge to communities 2. and 3., are they just theoreticians or can they generate some benefits? Fortunately there is a challenging way forward. The the approach in community 1 is stylised which therefore lends itself to automation. There are argumentation tools available by communities 2 and 3 and so one can provide community 1 with tools to use. Of course community 1 will test these tools over a period of time much like the testing of a new medicine.

## 1.1 Introduction

The aim of the paper is fourfold:

1. We consider the applied area of dealing with sex offenders where the expert testimony plays a central role. The assessment of the risk is an important tool for the courts for making decisions and judgments about sex offenders. The courts consult senior experts specialising in assessing risk of sex offenders according established international standards. The courts in Israel have a

stylised process in consulting the experts. Both in establishing the qualifications of the experts and in examining his testimony. The aim of this paper is to model in logic and argumentation this stylised process. We believe that this process actually applies to any expert testimony in Israeli courts and not just for expert testimony of the risk of sex offenders.

2. The second aim is to export to logic and argumentation ideas and formal tools which may emerge during our attempt to build the model in the first aim. Such export need not necessarily be connected with Argument schemes. In fact in our case the export is the idea of the attack as information input [6], and the theory of argumentation under universal distortion [33].
3. Our third aim is to provide the experts working with sex offenders with unified view of how to approach finalising their testimony about the risk of sex offenders. This will become clear as we progress in the paper. There are various internationally developed tools available (see Appendix C), but there is no unifying approach (Super View/Super tool).
4. The fourth aim is to refine the Walton scheme of argument from expert testimony and to set an example for refining other Walton schemes.

We therefore in this paper analyse and model in detail real case studies of the use of expert opinion (obtained by G. Rozenberg, who is an expert) on the question of the degree to which a sex offender is dangerous to society (expert opinion on risk evaluation of a sex offender). The modelling is based on theoretical foundations of [2]. The reader can consult an Appendix to this paper giving a formal background from argumentation), and on 11 year's experience of the second author.

The practical situation can be described schematically as follows:

1. The court is considering a sex offender and it needs to determine his/her degree of risk.
2. The court asks expert  $e_1$  for a report. The defence lawyers the sex offender also ask their own expert  $e_2$  for another report
3. The experts produce their respective reports, respectively arguing for a judgement about the degree of risk of the sex offender. For an expert  $e$ , let us denote his report by  $R_e$ . We thus have two reports on the table;  $R_{e1}$  of expert  $e_1$  reporting for the court and  $R_{e2}$  of expert  $e_2$  reporting for the defence. The reports have the form of a written document.

4. We have a court scene in which there is the Judge, the experts, a prosecutor, and a defence attorney. The procedures involve attempts at establishing two types arguments:
  - (a) Is the respective expert indeed an expert?
  - (b) Does the expert respective report indeed establish the claimed degree of risk?

Item 4(a) involves two argumentation networks  $Q_{e1}$  and  $Q_{e2}$ , each representing the respective discussion/debate about whether the respective expert is indeed an expert witness. Item 4(b) represents two argumentation networks  $S_{e1}$  and  $S_{e2}$ , each representing the discussion/debate about whether the respective expert report does indeed establish its respective conclusion. (The arguments in  $R_e$  appear/are absorbed in  $S_e$  respectively).

5. We thus get two pairs of argumentation networks, one for each expert, these are

$$M_1 = (S_{e1}, Q_{e1}) \text{ and } M_2 = (S_{e2}, Q_{e2}).$$

We can write  $M = (M_1, M_2)$  as one master network.

6. Note that the argumentation networks  $S_e$  and  $Q_e$  may not be of the same type. In fact we have not described yet what they respectively look like, this will come later in the paper, in Subsection 1.2 and Section 2.

Thus our model uses a two level argumentation network. Figure 1 describes the model. The network  $M$  shows two experts  $e1$  and  $e2$ . The argumentation networks  $Q_{e1}$  and  $Q_{e2}$  show the debate about qualification of the experts. The networks  $S_{e1}$  and  $S_{e2}$  show the arguments involving the degree of risk of the single accused sex offender.

The system  $M_1$  is the package related to expert 1 and  $M_2$  is the package relating to expert 2. The Judge in court sees both  $M_1$  and  $M_2$ . We call the overall system seen by the Judge  $M$ . This is the initial position. Expert 1 is the main expert hired by the court to give testimony. Expert 2 is hired by the defence. Expert 1 presents an argumentation network  $S_{e1}$  and an extension  $E1$  (see Appendix A for the concept of extension) which includes the key argument/assertion

$$A_1 = \text{"The sex offender is dangerous to society and to what degree".}$$

Expert 2 introduces  $S_{e2}$  and extension  $E2$  which excludes the statement  $A_1$  but includes his own statement  $A_2$ .

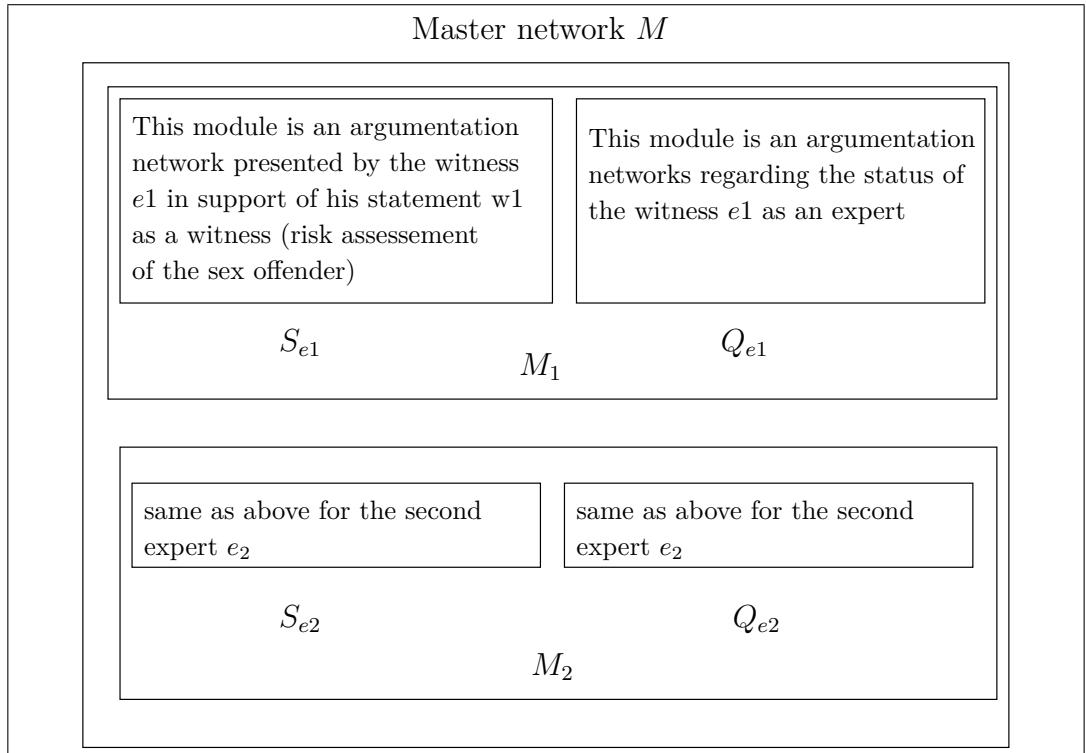


Figure 1: Two level argumentation network

The defence, prosecution and experts argue. The arguments can be attacked on  $Q_{e1}$  and  $Q_{e2}$  which establish their expertise or attacked from  $S_{e1}, S_{e2}$ .

Our modelling will be from real cases of how the system works.

The Judge sees  $M$  (he sees the interaction/debate which ends up in  $M$ ) and in his own mind transforms  $M$  to a final  $M^*$  which the Judge uses to make a decision on. (We cannot model  $M^*$ , it is in the Judge's mind), we need to do field work to interview many judges.

We invite the reader to consult the Appendix about the formal machinery of argumentation networks, however, in order to keep the flow of this section going let us say that formally an argumentation network has the form  $(S, R)$ , where  $S$  is a finite set of arguments and  $R \subseteq S \times S$  is the attack relation. An extension  $E \subseteq S$  is a set of conflict free arguments which satisfy certain conditions.

These concepts will all be defined in the later formal background section. Figure 2 gives an example of the defence claims.

$$\text{Extension } E2 = \{c = \text{in}, a = \text{in}, b = \text{out}, d = \text{out}\}$$

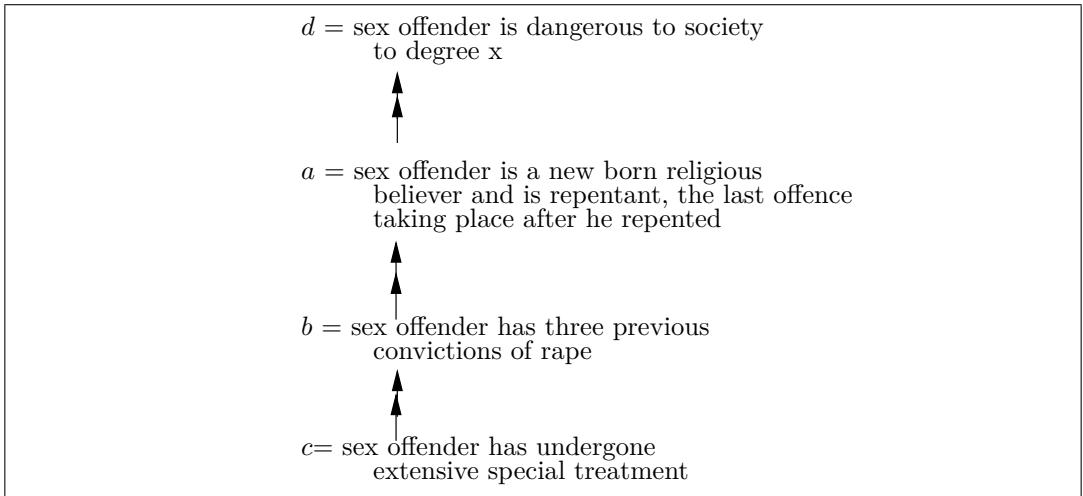


Figure 2: Sample argument chain

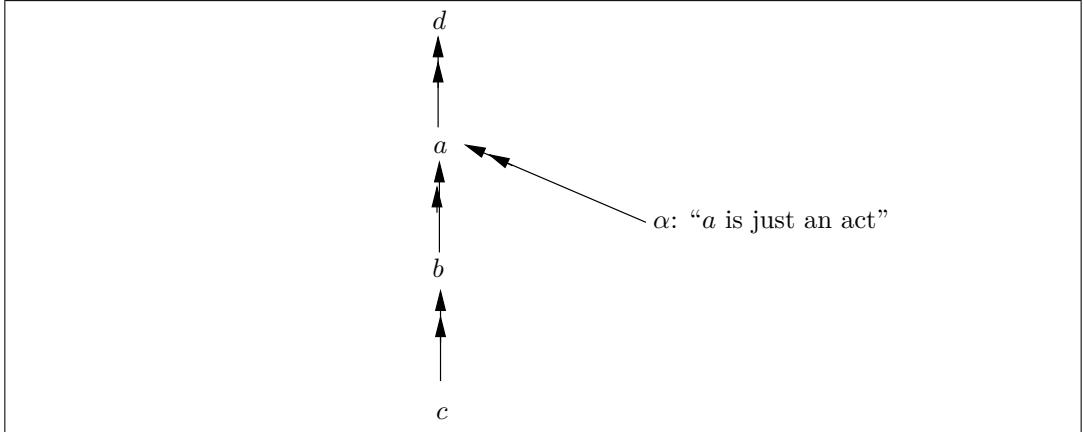


Figure 3: Sample attack on the chain of Figure 2

The expert  $e1$  claims that after interviewing the sex offender he believes  $d = \text{"the sex offender becoming a newborn religious believer"}$  is just an act and should be ignored. Therefore his  $S_{e1}$  is Figure 3.

$$\text{Extension } E1 = \{\alpha = \text{in}, c = \text{in}, b = \text{out}, a = \text{out}, d = \text{in}\}$$

**Remark 1.1.** We need to place this paper within the framework of existing research of logic, argumentation and law. The reader can consult [40].

Let  $\mathbb{CC}$  be a transcript of a court case proceeding and  $\mathbb{M}$  be a logic/argumentation

model of whatever sort (see [40]) which can address/model some or all aspects of such a court case  $\mathbb{CC}$ . We consider in this set up a single clear statement of fact  $E$  which requires an expert testimony to establish it.  $E$  plays a role in  $\mathbb{CC}$  and its logical modelling  $\mathbb{M}$ . But the procedure for establishing  $E$  through the expert testimony may be different and is disjoint from that followed in  $\mathbb{CC}$ .

The following are examples of this concept.

1. In a court case involving taxation it is important to establish when a deal was concluded. The “expert” testimony in this case is a bank record of the payment transaction.
2. In a rape case of a minor it is important to establish the age of the victim. The “expert” is a birth certificate.
3. A convicted prisoner seeks an early release from prison on account of argument  $E$ , where  
 $E = \text{prisoner has terminal cancer and has at most 30 days to live}$ .  
Here we need an expert testimony which may involve medical data and a separate cross examination of data and expert.
4. A mother has three babies who die in their sleep, and seems to be a natural unexpected death.  $E$  might be a statement that the probability of coincidence is almost nil. The expert might be a Bayesian maths Professor and the considerations mathematical.
5. The statement  $E$  might be a component in a trial of a sex offender where  $E$  is  
 $E = \text{the risk assessment for the offender to offend again within 6 months of his release is very high}$ .  
Again we need an expert to assert  $E$ .

Figure 4 explains schematically the role of the expert in the overall trial  $\mathbb{CC}$ . The expert’s participation is a bubble  $\mathbb{BB}$  in  $\mathbb{CC}$ . It is a mini-procedure not affected nor related to  $\mathbb{CC}$ . It can be modelled by  $\mathbb{N}$  which may be completely independent of the modelling  $\mathbb{M}$ .

Our paper deals with the procedures followed in Israel for bubbles  $\mathbb{BB}$  for establishing via expert opinion the statement  $E$  of the degree of risk of a sex offender. By examining the data and procedures of such cases we offer ideas towards modelling  $\mathbb{N}$  for  $\mathbb{BB}$ . If we want to compare our models with other works in the literature (see survey [40]), then we need to compare with discussions relating to models  $\mathbb{N}$  and not to models  $\mathbb{M}$  (see Figure 4).

We shall discuss this further in the conclusion section.

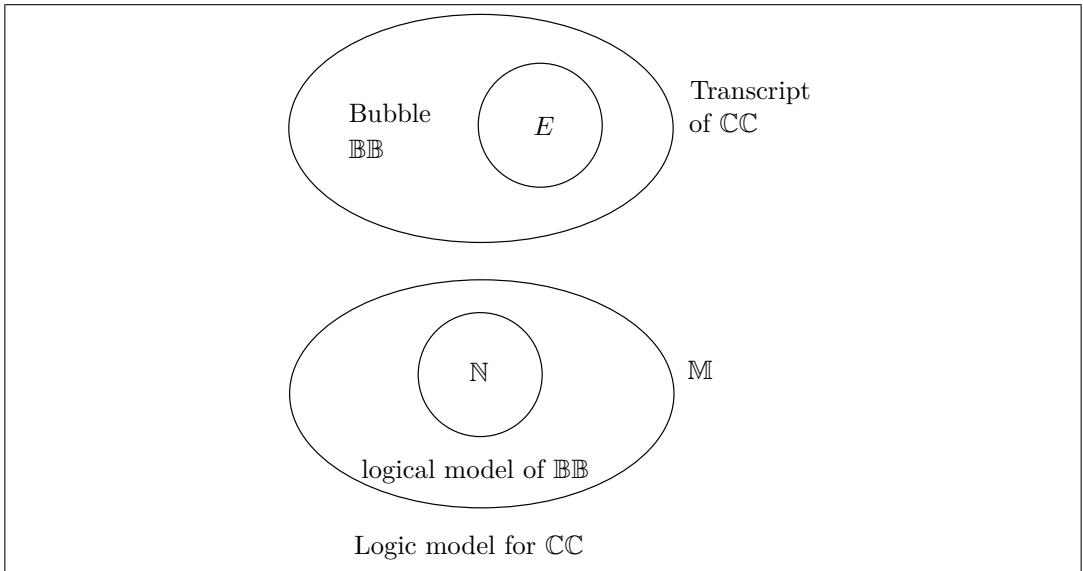


Figure 4

## 1.2 The expert witness networks

We now discuss and compare overall view of the role of expert witness in argumentation networks, as discovered and presented in our paper.

An expert witness network (*EW*-network) has a very specific form, as in Figure 5. We use “ $\rightarrow$ ” for attack and “ $\rightarrow$ ” for support. Note that this is the internal structure of the networks  $S_{e1}$  and  $S_{e2}$  appearing as black boxes in Figure 1. In technical terms (consult Appendix), we have the form of argumentation network with both attack and support which forms a tree directed at a single top argument  $w$ . The tree depth is 4. The main argument is  $w$ . The arguments  $\{s_i\}$  all support  $w$ . Each  $s_i$  is attacked by a respective  $a_i$  and is in turn defended by a respective  $b_i$ .

The actual attacks and support come with strength (either expressed as numerical strength or as qualitative strength such as weak, very weak, medium, etc.). The final decision (extension) of this entire network is a labelled output of the form

$$(\text{strength}; w).$$

The strength of  $w$  increases with more supporting arguments available and also increases if the supporting arguments are stronger. So to attack  $w$  and lower its strength we can attack and eliminate some of its supporting arguments or attack and lower the strength of such arguments. The most effective strategy is to attack

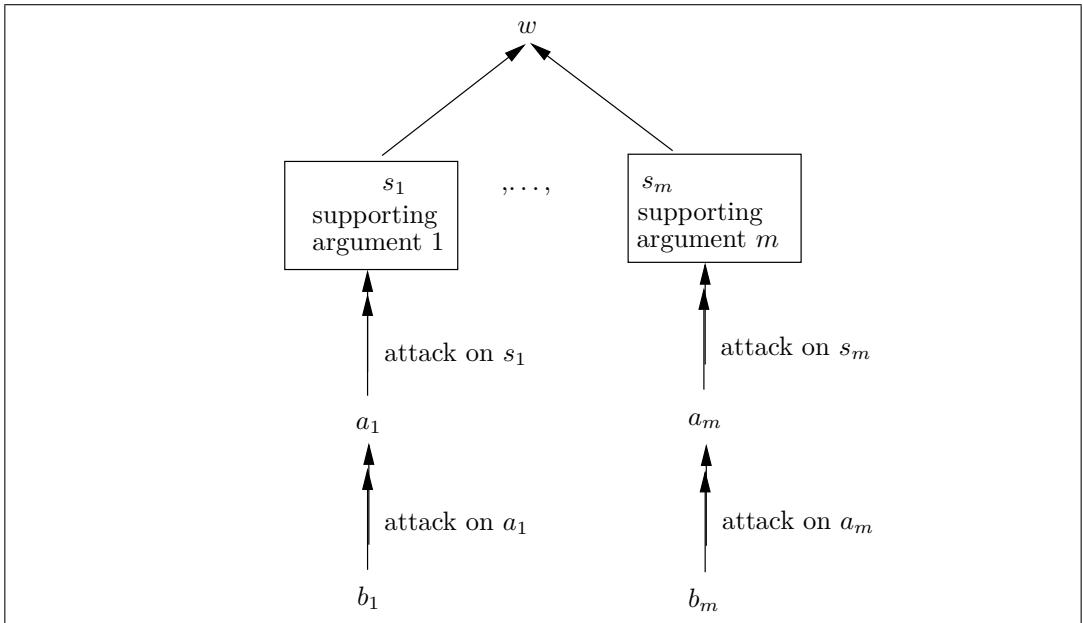


Figure 5: Expert witness  $e$ : The structure of the main argument Module  $S_e$

the expert and thus lower the strength or even eliminate him and all his arguments.<sup>1</sup>

The above format applies to the expert testimony for the case of expert for assessing the risk of sex offenders. An actual court case may involve other experts as well, for example medical experts. See Example 1.2. When several experts are involved the Judge will see more pairs of argumentation networks involving all the experts. For each expert the respective network goes into an overall network of the Judge. See Figure 6.

**Example 1.2.** *To see how the network of Figure 6 works, consider the following simplified story involving two types of experts, one a risk assessment expert and one a medical expert (so actually there could be 4 experts involved, a risk assessment expert and a medical expert invited by the court and another pair invited by the defence):*

*An offender attempts to rape a young woman who happens to be 3 months pregnant. The offender attempts to attack her and she pleads with him to leave her alone because she is pregnant. In a rare display of sympathy, the offender goes away. Two*

<sup>1</sup>In practice there are factors such as therapy which actually lower the risk value. We can view them as an attack with a negative strength. The way it is done is discussed in Section 4, presenting the formal model.

*weeks later the victim loses the child. The Judge has 3 statements<sup>2</sup> to consider (let us assume for simplicity of the example that the defence does not bring its own respective experts, but is satisfied in cross examining the court experts):*

1. *How dangerous is the offender, from risk assessment expert witness 1, who supports statement W1*
2. *Did the attempted attack on the woman cause the loss of the child? This is statement W2 from medical expert witness 2*
3. *Length of prison sentence to give the offender. This is statement J, which is determined by the Judge.*

*W1 and W2 are considered by the Judge in reaching his decision about J.*

*W1 and W2 come with their own networks as in Figures 1. So we have two networks challenging the expertise of the witnesses and in addition we have two more networks, one describing the debate with the risk assessment expert witness which has the form of Figure 5, and another network describing the debate with the medical expert witness. We do not know what structure this network has, because we have not researched and interviewed court cases with medical experts. It could be that medical expert witness networks also have the form of 5.*

**Remark 1.3.** *We note the following important comments:*

1. *The network of Figure 5 is a stylised (in Israeli courts) accepted matrix for expert witness testimony. This means that*
  - (a) *There are stylised legal and social factors to decide how "expert" the expert is (in Israel one gets official recognition by the system as being an expert on issue w) and attacks on the expert address these factors.*
  - (b) *The argument factors  $s_1, \dots, s_m$  are fixed factors for evaluating w, which different experts must address. This is a fixed matrix  $S_{(e,w)}$  for each statement w which requires expertise. So for w = risk of sex offender, we have its set of factors. For F = risk of fire hazard (of a business building), we have a different set of standard factors, etc). Again such factors are officially recognised and need to be addressed by any expert witness on w. (These factors are listed in Section 3. They are not a sample list chosen by the authors. They are the officially recognised list coming from the international community.)*

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<sup>2</sup>The reader should note that we describe the process schematically. The items W1, W2 and J are not arguments as they do not contain details. We are just describing the process the Judge has to go through in his mind.

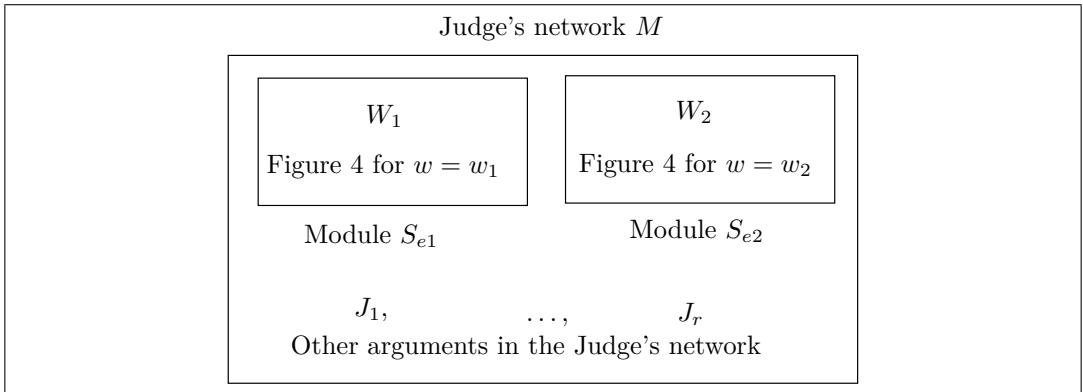


Figure 6: compare with Figure 1

*The attacks  $a_i, b_i$  are also standard. The expert witness expresses his use of  $s_i$ . The opposition attacks with  $a_i$  and the expert answers with  $b_i$ .*

*This is the end of the discussion. There is no more response/attack on  $b_i$ . The Judge sees the matrix of Figure 5 and emerges with the single outcome (Strength label:  $w$ ) and continues with his other items of the Judge's network.*

2. *Expert witness testimony is a matrix and so is different from ordinary witness testimony. The latter has no matrix form. An ordinary witness simply describes in his own words what he witnessed.*

## 2 The Attack on the Expert

In their book [7], Walton, Reed and Macagno put forward a list of argumentation schemes. On page 310 they have the scheme of argument from expert opinion. We quote:

*Major premise:* Source  $E$  is an expert in subject domain  $S$  containing proposition  $A$ .

*Minor premise:*  $E$  asserts that proposition  $A$  is true (false).

*Conclusion:*  $A$  is true (false).

### Critical Questions

CQ1: *Expertise question:* How credible is  $E$  as an expert source?

CQ2: *Field question:* Is  $E$  an expert in the field that  $A$  is in?

- CQ3: *Opinion question:* What did  $E$  assert that implies  $A$ ?
- CQ4: *Trustworthiness question:* Is  $E$  personally reliable as a source?
- CQ5: *Consistency question:* Is  $A$  consistent with what other experts assert?
- CQ6: *Backup evidence question:* Is  $E$ 's assertion based on evidence?

The Walton analysis of Arguments from expert opinion is just an initial proposal of 6 critical questions. We agree with the Walton program of argumentation schemes but would like to examine in more detail the scheme of argument from expert opinion and refine this scheme (this is done in Appendix B). Practical experience with expert opinion indicates that a much wider range of critical questions and queries is employed. There also remains the formal question of what is the structure and role of the expert opinion module in the overall master argumentation network (the context network in which the expert opinion is but one argument of many) and how such a module can integrate into this overall master argumentation network.<sup>3</sup>

The Walton model described above, proposes only 6 queries which can be put forward to the expert. Four of these questions relate/attack the expert and his qualifications and the remaining two relate to the substance of his testimony. The sex offender area presents a detailed example for the Walton Scheme. We have seen in the previous section the structure of the network representing the debate of the substance of the expert witness testimony in the case of an expert on risk assessment of sex offenders. We now address the debate about the expert witness qualifications as an expert. In this section we list many more queries and their proposed answers by the expert which have been used in practice by various defence attorneys over the course of 10 years.

The following should be noted.

1. From argumentation point of view, some of the questions involved in the cross examination/attack on the expert (by the defence) are requests for information, preparing the ground for/implying the attack the qualification of the expert. The experts reply by providing further information which deflects such attempts. In fact observing this sort of interplay inspired the idea of the attack as information input, [6].
2. The questions and answers involved in the attack on the expert of the sex offender case are typical in their generic structure and can actually apply, after

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<sup>3</sup>The Walton schema did not arise in the Walton, Reed and Macagno book, but first appeared in Woods and Walton, reprinted as chapter two of [37]. Also, this sort of scheme is shown to be (anyhow asserted to be) of very little help in legal contexts. The supporting argument to that effect can be found in [38] in the chapter on “Neutrality and Expertise”.

modification, to attack experts in areas other than sex offenders. See Appendix B. For example, we can apply the generic form to forensic psychiatry experts who specialise in determining the mental capacity of an accused person and even to experts assessing damages for insurance case.

3. Note that the attack and defence in this court case below are mostly not direct. In formal argumentation in order to attack the statement "I am an expert", for example, one directly asserts the statement "you studied at a third rate university and such institutions do not train experts". In a question and answer court case interaction the above attack can be implied by the question "which university did you go to?" and it can be defended by the answer "I went to a government recognised and government funded university", which implies that the university I went to is not third rate.

The following is an actual court case in which the second author participated. It lists the questions he was asked and his answers. The text presented is a translation of a transcription taken by the official court clerk of the Military Court in Jaffa, Israel, in a court case of a certain sex offender. The expert witness is Dr Rozenberg. The text is the exact detail of the cross examination questions presented to Dr Rozenberg and his answers. The original is in Hebrew and it was faithfully and accurately translated by the authors. Although our translation is not a legally accepted notarised "authorised translation", it is sufficient for the purpose of this paper. Some slight modifications were made to avoid the possibility of identifying the offender.

It is a case study of an attack on the qualifications of the expert. It also has a stylised structure. It is comprised from questions about how the expert acquired/studied for his qualifications, as well as how he went about (methodology used in) composing his report. There are also questions about specific items in his report, not with a view of attacking the item but with a view to see if the expert understands their significance. Other questions relate to whether the expert understands the limitation and margins of error of his report.

There are also traditional Fallacies, trick questions, tempting the expert to answer in such a way that he appears to be racist, over-confident and full of his own importance, unable to take criticism or timid, hesitant and unsure of himself. We must remember that these questions are asked on the witness stand in front of a Judge and are intended to discredit the expert.<sup>4</sup>

We need to explain to the perceptive reader what is our purpose in quoting the case study below. We just want to give the reader a flavour of what is going on in

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<sup>4</sup>Doug Walton and John Woods jointly and separately have written many wonderful books on the Fallacies. The reader should consult the internet.

establishing the qualification of an expert in the case of sex offenders testimony. We are not analysing and examining the text according to some critical methodology but only noting its structure. Something we could do in the future, for example, is to look through many such transcripts and see how the defence lawyers try in a subtle way to personally discredit the expert. We just note in this paper that such attempts take place but we do not study the allowable limits (in Israeli practice) and subtlety of such actions.

We encourage the reader to think of a different Expert, say a fire fighter expert testifying that the fire in a factory was caused by faulty electrical system not installed correctly. In this case the "accused -sex offender" corresponds to "the electrical system installation" and the "degree of dangerousness/risk assessment" corresponds to "the degree of negligence and faulty standards in the electrical system installation". Further, "the sexual offender medical treatment" corresponds to "maintenance of the electrical system" and "abuse of the accused" corresponds to "overloading and misuse of the electrical system". We leave further analogies to the reader.

The next section will give case study examples of attacks on the actual testimony of the expert.

## Court case dated 9.4.2013

**Question 1.** What is your qualification?

**Answer 1.** 8 year's experience. I also train young clinical criminologists. I also treat both young and older offenders in jail and outside the jail. I give lectures to various experts in many forums. I have an official licence from the government.

**Question 2.** Is there a structured training course that experts in your area have to take?

**Answer 2.** There is no such course. You can take an MA degree in clinical criminology and then there is a regulated further study where you first assist an experienced expert in his cases and then continue on your own, and in time have your own assistant trainees.

**Question 3.** What are the steps taken in your evaluation of how dangerous the accused is?

**Answer 3.** I collect every possible document on the person. I even check his facebook account, get previous convictions, get previous expert reports, military service reports, hospital treatment reports and social services reports. I then conduct a clinical interview with the person and if possible interview and talk to all his relatives.

**Question 4.** Are you doing all of this alone? It is possible that someone else, had he/she been with you would have reached a different conclusion?

**Answer 4.** I do it alone. However, there is a legal expert advisor, who is also a clinical criminologist who reads my report. If I have doubts, I consult colleagues. Such colleagues of similar qualification as myself who I expect will reach a similar conclusion.

**Question 5.** What method do you use?

**Answer 5.** I use *structured clinical evaluation*.

**Question 6.** What exactly do you check? How do you put all your findings together and get a result?

**Answer 6.** I construct a picture and address both static and dynamic clinical factors. You (the lawyer asking Question 6) are asking me to distill to a few sentences, many years of experience, the reading of vast professional literature and clinical expertise. This is not possible.

**Question 7.** How important is his childhood? Maybe it was traumatic? Maybe he was sexually abused?

**Answer 7.** His childhood is important. One can later identify if he developed repeating patterns of behaviour. Having traumatic experience does not diminish him being dangerous to society. The trauma can even make him more dangerous if it has not been dealt with and the person can be influenced by it even today.

**Question 8.** Why for two people who grew up in the same neighbourhood does one become a sex offender and one not? What makes one become a sex offender?

**Answer 8.** This question has many psychological explanations from the area of social psychology, but the simple answer is that one chose to be an offender and the other did not.

**Question 9.** Surely you will agree with me that the evaluation of dangerousness is speculative?

**Answer 9.** I disagree. It is a science which we continually try to improve and make more accurate.

**Question 10.** What is the percentage of mistake?

**Answer 10.** We are human and we can make mistakes. In the middle evaluation of risk the error is greater than at the extremities. There is less error in high risk or low risk evaluations.

**Question 11.** The person is in jail and is angry and frustrated. It influences his behaviour when you interview him.

**Answer 11.** I work a lot with different people from different backgrounds and I have learnt over the years to isolate this factor and give the factor its proper perspective. I can construct a good picture independent of the local state of mind of the subject. I also try very hard to make the subject comfortable during the interview.

**Question 12.** What is the effect of the person's confession?

**Answer 12.** A confession does not influence the risk assessment. It does influence his prospects of successful rehabilitation.

**Question 13.** If a person does not confess then he cannot be rehabilitated?

**Answer 13.** Not true. There is also treatment for those who deny wrong doing, and world literature shows it diminishes the risk and dangerousness of the subject.

**Question 14.** Surely you understand that if a person was drunk or under the influence of drugs and his judgement was temporarily diminished and he offended, then certainly he does not deserve a heavy punishment?

**Answer 14.** Punishment is not my area of expertise, and I will not say anything about it. I concede that if the person is on drugs then his behaviour is context-dependent, but we need to ask what will happen if he goes on drugs again.

**Question 15.** Surely you accept that if a person is drunk at a party and touches a girl's breasts, then if he were not drunk he would not have done it?

**Answer 15.** What if the next day he gets drunk at another party and does it again?

**Question 16.** For a person to rape a woman she needs to be there, if she were not around he would not have raped her?

**Answer 16.** Surely you understand that your question is problematic. I hope you are not suggesting that women would stop walking the street so as not to provoke rape?

**Question 17.** You conducted one interview, very short, half an hour. This is not enough!

**Answer 17.** I did not record the time, but I am sure it was not just half an hour! I estimate at least an hour and a half to two hours. Had I needed more time, I would have taken more time.

**Question 18.** My client felt like he was in an interrogation chamber!

**Answer 18.** I tried in every possible way to make him comfortable. I supported him and encouraged him. I insisted his gaolers take off his handcuffs. I did not agree to interview him handcuffed!

**Question 19.** You pushed him into a corner.

**Answer 19.** Part of the interview is to confront him with inconsistencies in his own version of the story. If he says two contradictory things, it is important to find the truth and also to see how he responds when caught lying.

**Question 20.** Give me some examples of factors which increase the assessment of risk and dangerousness and explain why these factors are relevant and contribute.

**Answer 20.** Young age of the offender, offending a male victim, offending victim in age group 13–15, offending in a public place, recidivist sex offender, attacking foreign victim (tourist).

**Question 21.** Is there different risk assessment, say between Russians vs. Ethiopians?<sup>5</sup>

**Answer 21.** There is no research on this. You need to be familiar with their respective mentality. I have many cases of Ethiopians, so I know their customs.

**Question 22.** I want you to give me a computer-like table, factor  $x_1$  gives risk increase  $y_1$ , factor  $x_2$  gives  $y_2$ , etc.

**Answer 22.** A person has a complex personality, is not a computer. You cannot make a table like that. A table would ignore many important factors unique to each individual's person.

**Question 23.** Why not use existing statistical analysis following data about different cases?

**Answer 23.** Please look at this *stat99-tool*. A child can do the table. The table does not include, for example, if the subject had treatment or made an effort to change. Is he hyper-sexual? Does he have ego problems? Is he in a supportive environment? The tool is just numerical statistics.

**Question 24.** Your answer 23, is it knowledge or conjecture?

**Answer 24.** I know the literature and I included in my report the unique characteristics of the subject. I try to be up to date in the professional literature.

**Question 25.** There are research results which contradict what you are saying.

**Answer 25.** I'll be happy to see them. It is important to understand that there are some researches around that are esoteric and some were conducted on small sample populations.

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<sup>5</sup>Note that this is a trick question trying to hint at racism.

**Question 26.** What percents do you give to clinical factors and what to actuarial factors?

**Answer 26.** I cannot give percentage division. I weight all factors.

**Question 27.** Don't you think it is arrogant to claim that in a 1.5–2 hour interview you can assess a man?

**Answer 27.** I make every effort to check everything available about the person and check recurrent behaviour patterns. I do the maximum I can.

**Question 28.** Perhaps your maximum is objectively really minimum.<sup>6</sup>

**Answer 28.** I collect every possible relevant information.

**Question 29.** He was treated badly in prison. Why did you ignore this?

**Answer 29.** No such thing was reported to me.

**Question 30.** Why did you not use the test report about the person?

**Answer 30.** There was no such report.

**Question 31.** Why did you not address a treatment the person received?

**Answer 31.** I addressed it on page xxx of my report. I wrote the subject was not emotionally open to it.

**Question 32.** Today he understands he was wrong and wants to be treated. Doesn't this make him less dangerous?

**Answer 32.** The mere declaration of desire for treatment does not reduce risk. If indeed he takes treatment, then we can check if he became less dangerous. But if he starts treatment and then stops before the end of the process, this could be an indication that he is more dangerous.

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<sup>6</sup>This is another trick question.

**Question 33.** Do you really think that if he gets a prison sentence this would help his condition?

**Answer 33.** This is not my speciality. This is just a legal judgement question.

**Question 34.** You asked the subject some very personal questions, like about masturbation, if you were to ask me such questions, do you expect I would answer you?<sup>7</sup>

**Answer 34.** I ask the question in a specific context. I explain why I am asking and the subject agrees to answer.

**Question 35.** Did you explain to the subject how important it is that he cooperates?

**Answer 35.** I repeatedly explained this to him many times. I tried to encourage him.

**Question 36.** I assume that there is no chance for someone who does not cooperate to get low risk assessment?<sup>8</sup>

**Answer 36.** Not true. There were cases of non-cooperating subjects to whom I gave low risk assessments.

### 3 The Attack on the Expert Testimony

#### 3.1 Background

There is consensus in the international community (ATSA — Association for the Treatment of Sexual Abusers) on the factors which contribute to the assessment of risk of sexual offenders. There are also several actuarial tools to help the expert in assessing the risk of a given patient. The tool asks the expert to evaluate/answer questions about the individual patient and then gives a risk assessment a final grade which is a number  $x$ ,  $k < x < m$ , where  $x, m, n$  are integers (depending on the tool). The expert can use several tools, as well as some additional clinical factors (determined by the experience of the individual expert) and the expert integrates

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<sup>7</sup>This is another trick question, maybe hinting the expert himself is a bit weird

<sup>8</sup>This may be another trick question hinting at ego problems of the expert

all these results (in his own mind, as there is no Super Integrating Tool) into a final determination.

There is no super-tool which can integrate/reconcile the results of several existing tools. The expert has to decide which tools to use and how to integrate them. The ATSA list of factors are recognised by the Israeli courts, and the expert witness is expected in court to address these factors and be challenged by the defence attorney of the sex offender. The main tools are listed in the Appendix and the typical questions and answers in court are presented in this section. The list in this section does not represent any particular court case but is based on 11 years practice and thousands of expert opinions put forward by the second author. The courts follow Israeli law. The defence lawyer may invite his own expert to present a possibly different report and different conclusion. In this case the second expert will also appear in court and be subjected to the same procedures as the first expert with the prosecutor performing the attacks on the second expert factors.

This section deals with the attacks on the expert testimony. The structure of the testimony is as outlined in Figure 5. Each numbered item below represents an attack sequence on a factor  $s$ . Each item comprises of three sub-items;

- what the expert says concerning factor  $i$ , denoted by  $s_i$ . (The expert can either introduce the factor in his considerations or not mention it at all. The factor may support the increasing of risk assessment of the offender or support the decreasing of the risk assess of the offender. There are international packages which assess the contribution of such factors  $s_i$ .)
- the attack on what the expert says, denoted by  $a_i$ . (This attack is mounted by the defence. So if the expert does not mention a factor which decreases the risk assessment the defence can ask why? If the factor increases the assessment of risk the defence might add information which makes the increase smaller. If the expert gets his facts wrong, then his entire testimony is at risk and the expert loses credibility. So this does not happen in practice. Note further that the node  $a_i$  denotes all of what the defence says which can be comprised of several attacks in the formal sense, or a joint attack or a higher level attack, etc. )
- the experts answer to the attack denoted by  $b_i$ . (Many of the answers of the expert are explanations or more information, which motivated the authors to write the theoretical paper [6].)

The factors come with labelling of strengths: low, moderate and strong. We shall see in the Appendix, which surveys Tools which assess the strength of these factors,

that numerical strength are assigned to them both positive and negative numbers, the qualitative strengths can be derived from these numbers. Note that the factors  $s_i$  can be factors which increase risk or sometimes factors which decrease risk (such as participation in therapy). We still view them as “supports” with negative input, which turns them as “attacks”. The examples below show that the “counter attacks”  $a_i$  on  $s_i$  can either question the strength and the significance suggested by  $s_i$  or they can question the validity of  $s_i$  in applying or not applying to the sex offender in question or can be factual attacks on the factual part of the factor  $s$ . Some attacks  $a_i$  are logical fallacies. The replies  $b_i$  to the items  $a_i$  are more in the nature of explanations, rather than “counter-counter-attacks” on  $a_i$ . We shall see in Section 4, when we present the formal model, that this type of sequence, namely:

$$b_i \rightarrow\!\!\! \rightarrow a_i \rightarrow\!\!\! \rightarrow s_i \rightarrow w$$

where the nature of the double arrow “ $\rightarrow\!\!\! \rightarrow$ ” changes in the sequence, requires special attention and formal modelling.

We need to be more explicit here. Let us assume that the expert puts forward factor  $s_i$ . Factor  $s_i$  has two parts, the factual part and the assessment part arguing its contribution to how dangerous the offender is. For example The lawyer of the defence attacks  $s_i$  with counter argument  $a_i$ . If the counter argument is successful against the factual part, then the credibility of the expert is shattered, and all his support arguments  $s_j$  for all  $j$  are destroyed. Take  $s_{15}$  for example. The factual part is that the offence was in a public place. The attack  $a_{15}(b)$  simply says that the attack was at night at an isolated part of the public place and so the factor should not be used. This is not a factual attack. But if the defence proves  $a_{15}(a)$ , that the attack was at home, then this is a factual attack and all the support arguments  $s_j$  for all  $j$  are destroyed. Compare with Definition A.4. On the other hand if the lawyer’s attack  $a_{15}(a)$  is factually destroyed by  $b_{15}$ , then his other arguments can still be used. The lawyer is not an expert, he is not committed to the same credibility criteria, and he is expected to try all kinds of arguments.  $a_{15}$  may be destroyed but his other arguments may survive. The defence lawyer may invite his own expert to present a possibly different report and different conclusion. In this case the second expert will also appear in court and be subjected to the same procedures as the first expert with the prosecutor performing the attacks on the second expert factors.

We finally would like to put the contents of this section (namely the attack on the expert testimony) into a general perspective from the point of view of argumentation: An influential classification of dialogue types is that of Walton and Krabbe [22]. We recall their distinction between persuasion and deliberation dialogue. The goal of a deliberation dialogue is to solve a problem while the goal of a persuasion dialogue is to test whether a claim is acceptable. The material of this section falls under the

category of persuasion dialogues. In such dialogues, two or more participants try to resolve a difference of opinion by arguing about the tenability of a claim, ( in our case the degree of risk of a given sex offender), each trying to persuade the other participants ( in our case mainly the Judge) to adopt their point of view. General dialogue systems regulate such things as the preconditions and effects of speech acts, including their effects on the commitments of the participants, as well as criteria for terminating the dialogue and determining its outcome. Good dialogue systems regulate all this in such a way that conflicting viewpoints can be resolved in a way that is both fair and effective [23]. In our case the procedure as we described is a highly stylised tree of depth 4, and the final arbitor is the Judge.

Furthermore the particular arguments used are informational and numerical, as we shall see in later sections.

The reader would also benefit greatly from looking at the important paper of Gordon, Prakken and Walton, [21] and the survey [24].

Let us begin.

## Full Matrix/List of Relevant parameters/ factors to assess sexual risk

*Note that the attacks on these factors are taken from protocols of actual cases involving Dr Rozenberg and his actual replies. They are not from a single court case but a representative compilation. But each sequence was actually asked and answered in court. The wording describing the node  $s_i$  is the authors wording simply saying the factor was or was not introduced in the experts report. We could have written "+" and "-". The entries for  $a_i$  and  $b_i$  are from transcripts of actual court cases.*

### 3.2 This factor is the age

Sex offender's age taken into account when making the risk assessment. Below is the official table of the age groups and the risk strength assigned to them

Risk factor	Age group
1	18–34.9
0	35–39.9
-1	40–59.9
-2	60 or older

A significant factor with at least moderate importance

- $s_1$  The expert gives a contribution due to this age factor

- $a_1$  The attack says that the offender is older so according to the table the risk factor strength should be less.
- $b_1$  The expert reply: Recent literature shows the relationship between the age of the offender to a level of sexual risk is not so dichotomous, for example, we learn that the dangerousness decline in child molesters is milder and occurs in older ages than among rapists. Also, the person who committed the offence in an advanced age, his age should not be taken that seriously as a risk reducing factor.

### **3.3 Division/ classification of sex offenders by the official definition of the nature of their offence**

child molester- victim under age 13

rapist- victim above 13 years old. A significant factor with at moderate importance

$s_2$  — The expert gives a contribution of risk due to this factor.

$a_2$  — The attack says that the expert should have taken into account that risk of rapists against the passage of time declines at a faster rate than that of in child molester.

$b_2$  — Expert reply: Recent literature shows the relationship between the age of the offender to a level of sexual risk is not so dichotomous, for example, we learn that a dangerousness decline in child molesters is milder and occurs in older ages than among rapists. Also, the person who committed the offence in an advanced age, his age as a factor that reduces dangerousness should be taken with a grain of salt.

### **3.4 Family status**

The official classification is as follows:

Bachelor — a person who has not lived with an Intimate Partner nor had a joint household with a partner for a period of at least 2 Years. If bachelor then this factor raises the dangerousness.

This factor is of Low importance.

$s_3$  — The expert put forward this factor

$a_3$  — The attack: You can see that the accused person is acquainted with a woman, maybe even married her, and managed a relationship for almost 2 years. Technically he is considered a bachelor but arguably it teaches us about his capabilities and reduces risk.

$b_3$  — Expert reply: The literature indicates that the fact a person contacted and possibly married is insufficient. Only if he would be able to manage relationships

with common household for two years it will show the ability to keep significant relationship.

### **3.5 Index Non-sexual Violence (NSV) □ Any Convictions**

If the offender's criminal record shows a separate conviction for a non-sexual violent offence at the same time they were convicted of their Index Offence, this factor raise the dangerousness.

A significant factor with at least moderate importance

*s<sub>4</sub>* — Expert mentions use of violence.

*a<sub>4</sub>* — The attack: If the offender's criminal record does not show a separate conviction for a non-sexual violent offence at the same time they were convicted of their Index Offence, this factor should be ignored.

*b<sub>4</sub>* — Expert Reply: Do not ignore the fact that almost all sex offences include aspects of coercion and violence and the choice to convict a person of a crime of violence is a legal issue rather than sex offence issue.

### **3.6 Prior Non-sexual Violence □ Any Convictions**

Having a history of violence is a predictive factor for future violence. A significant factor with moderate importance

*s<sub>5</sub>* — Expert did not address this factor, (meaning that in the court case this factor was not mentioned in the expert's report. Since this is a mitigating factor the defence asks why was it not mentioned).

*a<sub>5</sub>* — The attack: If not convicted, so arguably he usually keeps the law and it is one-time lapse and the current conviction probably discourages him.

*b<sub>5</sub>* — Expert reply: Sometimes the person tells us himself that once he used violence against family members or others and the absence of conviction of violence does not necessarily indicate that he never used violence.

### **3.7 Prior Sex Offences**

The best predictor of future behaviour, is past behaviour. A meta-analytic review of the literature indicates that having prior sex offences is a predictive factor for sexual recidivism.

A significant factor with high importance

*s<sub>6</sub>* — expert mentioned that the person had previous offences which increase the risk.

*a<sub>6</sub>* — Attack : This was a long time ago. Since then for many years there were no conviction. So previous conviction probably discouraged him.

*b*<sub>6</sub> — Expert Reply. Criminal that have several conviction at any time in the past is still to be considered dangerous. The existence of a conviction for sex offence often indicates quality of functioning of law enforcement officials and victims readiness and motivation, (if such were indeed), to complain. Also, in law, sometimes for a similar offence the offender can be convicted on different offences, for example, reveals himself in public might be convicted of committing a public indecent assault, but charges may be either wild behaviour in a public place.

### 3.8 Prior Sentencing Dates

This item relate to criminal history and the measurement of persistence of criminal activity. The Basic Rule: If the offender's criminal record indicates four or more separate sentencing dates prior to the Index Offence, the offender is more dangerous. Count the number of distinct occasions on which the offender was sentenced for criminal offences. The number of charges/convictions does not matter, only the number of sentencing dates.

A significant factor is law importance

*s*<sub>7</sub> — Expert used this factor, even though the past convictions were not sex related.

*a*<sub>7</sub> — Attack: If not convicted before, so arguably he usually keeps the law and it is one-time lapse and the current conviction probably discourages him. We can claim that if the subject made prior offences that teach about his criminal lifestyle, the risk sex assessment should evaluate only sexually dangerous and nothing else and the index offence is one-time lapse. People with criminal life style mostly feel disgusted by sex offences and shy away of it and their self-esteem injured therefore current conviction probably discourages him

*b*<sub>7</sub> — Expert Reply: A person who has a background of criminal offences shows difficulty to maintain limits and respect the boundaries of correct behaviour and one of the main concerns is that reluctance not to respect the laws and other limits may result in repeated sex offences, too.

### 3.9 Any Convictions for Non-contact Sex Offences

Offenders with paraphilic interests are at increased risk for sexual recidivism. Offenders who engage in these types of behaviours are more likely to have problems conforming their sexual behaviour to conventional standards than offenders who have no interest in paraphilic activities. If the offender's criminal record indicates a separate conviction for a non-contact sexual offence, the offender is more dangerous.

A significant factor with high or very high importance

*s<sub>8</sub>* — Expert did use this factor

*a<sub>8</sub>* — Attack: You can argue that sex is contactless low threshold of severity of injury and despite the offence with high recidivism, even if a person carries the offence again, the damage it can cause to the potential victim not so strong a man performing very offensive offence with contact and entering offences. Typically, offenders who committed Non-contact Sex Offences contact offences are less likely to make contact sex offences.

*b<sub>8</sub>* — Reply: The person that makes risk sex assessment is not a judge, and it is not his job to determine severity of harm, but to indicate to which group the subject belongs and what are the chances that he will make again sex offences, regardless of the severity of the offence.

### **3.10 Unrelated Victims (victim known to the offender, but not family)**

The items concerning victim characteristics. Sex offence on Unrelated Victims related to higher risk assessment. Research indicates that offenders who offend only against family members recidivate at a lower rate compared to those who have victims outside of their immediate family.

A significant factor with high importance

*s<sub>9</sub>* — Expert used this factor

*a<sub>9</sub>* — Attack: Offender who harm the victims in his family is less dangerous because he is often perceived as a "lazy" who probably will not look for victims outside the family.

*b<sub>9</sub>* — Reply: Despite the fact that the person who harm victims within the family hurts somebody outside the family is relatively low, but it still exists. In addition, the offence to be possible because of problematic family climate expressed within weak limits and if the family circumstances do not change, significant treatment, then the individual may return to the same environment that allowed the violation in the past and may again exploit his authority and hurt.

### **3.11 Any Stranger Victims?**

The Basic Principle: Research shows that having a stranger victim is related to sexual recidivism. If the offender has victims of sexual offences who were strangers at the time of the offence (stranger is defined as a person known to offender for less than 24 hours prior to the offence), is related to higher sexual recidivism.

A significant factor with high importance

*s<sub>10</sub>* — Expert says the victim was a stranger.

*a<sub>10</sub>* — Attack: A strong connection formed between the offender and the victim, even though they met less than 24 hours (they had intimate conversation before the offence).

*b<sub>10</sub>* — Reply: But he hurt the victim, who is not a relative and possibly in future is pushing a minimal introduction to compromise.

### 3.12 Any Male Victims?

The Basic Principle: Research shows that offenders who have offended against male children or male adult recidivate at a higher rate compared to those who do not have male victims.

A significant factor with high importance

*s<sub>11</sub>* — The expert used this factor

*a<sub>11</sub>* — attack- you say that a sex offender attacking male victims is more dangerous than offender who attacks female victims. This is clearly a prejudiced judgement between males and females. You see a man attacking another man as sick and therefore you make him more dangerous.

*b<sub>11</sub>* — Reply There is no prejudice here, the observation is based on statistical data.

### 3.13 Alcohol consumption is clearly associated with violence

This is a strong factor in assessing risk. *s<sub>12</sub>* — The expert increased the risk owing to the offender's high alcohol consumption

*a<sub>12</sub>* — Attack 1: the offender has rehabilitated, he is no longer drinking.

*a<sub>12(b)</sub>* — Attack 2: the man has been alcoholic for a long time without offending, so there is no real connection.

*b<sub>12</sub>* — Reply: The expert assertion about use of alcohol is based on the offender report of his use of alcohol, and it is well known that such reports can be unreliable. The offender report of alcoholism could be a cover for some more serious pathological causes.

*b<sub>12(b)</sub>* — Furthermore the use of alcohol can cause offence while drunk. This is a worrying factor because he might drink and be inhibited in the future and offend again.

### 3.14 The use of hard drugs

The connection between being a drug addict and sexual offence is not strong enough. Research identifies two types of drugs (excluding alcohol) contribute to hyper sexual-

ity, namely Cocaine and Meta-amphetamines. To the extent that we get confirming scientific reports about the connection, we will consider drug abuse as a risk factor. At any rate this is a weak factor

*s<sub>13</sub>* — The expert mentions this as a factor.

*a<sub>13</sub>* - Attack 1 —The offender has rehabilitated, he is no longer drug addict.

*a<sub>13(b)</sub>* — Attack 2 The man has been addict for a long time without offending so there is no real connection.

*b<sub>13</sub>* — Reply. The expert assertion about use of drugs is based on the offenders report of his use of drugs, and it is well known that such reports can be unreliable. The offender report of drug addiction could be a cover for some more serious pathological causes. Furthermore the use of drugs can cause inhibited behaviour and to lead to offence while under the influence. This is a worrying factor because he might use drugs in the future and offend again. Note that meta-amphetamines do increase /flood the sex drives and therefore might push the man to further offence.

### **3.15 Sexual offence while the offender was under court order**

This could be, for example, a legal trial, conditional sentence, legal restrictions, etc. This is a strong factor

*s<sub>14</sub>* — Expert used this factor.

*a<sub>14</sub>* — Attack - the offender has been punished and will behave. Furthermore he did not understand at the time the full meaning of legal restrictions but now he does understand.

*b<sub>14</sub>* — Reply: Maybe the offender just says he will now behave but this does not ensure that he will not offend again.

Furthermore the effects of the present trial and punishment will wear off as time goes by.

### **3.16 Sexual offence in a public place**

This is a medium strength factor

*s<sub>15</sub>* — The expert used this factor.

*a<sub>15(b)</sub>* — Attack- The offender made his offence at night at insulated place and the chance that somebody would see him is low.

*b<sub>15</sub>* — It is still a public place and even at insulated places people can pass. It is known that offending in a public place indicates a deep difficulty to restrain oneself and control one's drives.<sup>9</sup>

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<sup>9</sup>One of the referees made the following comment about this case (factor *s<sub>15</sub>*), I quote:

“Why might someone not attack on the basis that it was raining, so there was a lower

### 3.17 The use of force while offending

This includes using firearms or the threat of using firearms, or use of physical force, or threat of physical damage or kidnapping.

This is a medium strength factor.

$s_{16}$  — Expert uses this factor.

$a_{16}$  — Threat is not really use of force.

$b_{16}$  — professional literature shows it is it. Threat is definitely count as a use of force. Many times it is enough to compel person to make things that he didn't. Conviction of violence in addition to conviction of sexual offence indicates the offender not only cannot control his sexual drives but also cannot control his aggression.

### 3.18 The offender subjected the victim to a variety of sexual violations

These include: Penis penetration to vagina, finger into vagina, foreign object into vagina, groping the victim, masturbating over the victim, forcing the victim to grope the offender, forcing victim to masturbate, Forcing victim to give offender oral sex, offender giving victim oral sex, offender exposes himself (excluding exposing for the purpose of executing the offence), forcing victim to make sex with a third party/object, penetration of penis to anus, penetration of finger to anus, penetration of object to anus, kiss, forcing the victim to masturbate the offender.

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chance of being interrupted? Or in a place that was not visible to passers-by? Why is the attack a conjunction of night time and isolation — surely isolation could be enough to form an attack? What I would expect is that the typical attacks would be evidenced through reference to the court record — and then I would expect to see many different attacks that might be levelled arranged into groups, classes, or hierarchies perhaps. Similarly with defences against those attacks."

We note that  $s_{15}$  is a transcript of a case in court. The reader might ask whether we have collected an exhaustive list of transcripts and analysed them and examined them? Maybe the above suggested referee questions were asked in other cases? The answer is we did not assemble a larger set of transcript but a representative one. There is sufficient data and we learnt a lot from these examples already, namely the idea of the attack as information input, see [6].

Let us examine the transcript of  $s_{15}$  itself, to show the reader what we mean by representative. The attack  $a_{15}$  adds factual information, and tries to say, given this information, then the place was not really public. The response  $b_{15}$  is actually saying that the factor's contribution to the risk assessment of the sex offender was determined statistically based on the formal definition of public place (as opposed to the concept of not containing people) and the extra information is not relevant to the statistics. Again  $b_{15}$  is an attack by adding information.

In fact  $b_{15}$  is also a valid counter-attack to the referees suggestions above ("it was raining", or "it was in a place that was not visible to passers-by", etc...), again because such cases did not go into the statistics!. Compare with  $b_{20}$ .

This is a weak factor

*s*<sub>17</sub> — Expert lists the offences done by the offender

*a*<sub>17</sub> — attack. These should be considered a single offence and not a list of multiple offences. Moreover, almost any rape or other sex offence including a variety of sexual violations. For example, it is almost impossible to rape without groping the victim.

*b*<sub>17</sub> — Reply: yes legally it is a single offence, but statistics shows that multiple components increase risk of re-offending in the future. The offender needs multiple stimulations to satisfy his drive. The offender might even commit some unusual acts in the future, and if the indictment detail the violation, than probably is was a different offence and not a basis to perform another offence.

### **3.19 Sex offender with victims from different age groups**

In such a case the offender is considered more dangerous because the offender has a larger group of potential victims.

The age groups are:

0–6.99; 7–12.99; 13–15.99; 16 and above

*s*<sub>18</sub> — Expert mentions this factor

*a*<sub>18</sub> — Victims may not look their ages so it only an illusion that the offender is not focused on a single age group.

*b*<sub>18</sub> — Reply. As an expert I have a choice and judgement on whether I work like a simple mathematical machine or try to decide on the correct evaluation and scenario. I try to understand the triggers motivating the offence and using that evaluate how dangerous the offender is and to what age groups. I especially examine the significance of cases where the victim's age is near the boundaries.

### **3.20 Age of victim is 13–15 years**

An offender attacking this age group is more dangerous if the offender is 5 years older or more than the victim.

This is a medium factor

*s*<sub>19</sub> — Expert mentions this factor

*a*<sub>19</sub> — Attack. The age division into group is arbitrary and further teenagers.

Vary in how old they look, and many times 13–15 years old looks like elder.

*b*<sub>19</sub> — Reply: the expert exercises judgement. The problem here is that the offender seeks an intermediate age group between children and grownups. There is the danger of a shift into the neighboring age groups. It is offenders responsibility

to know the exact age of teenager. And mostly the confusion is a result of cognitive distortion of the offender.

### **3.21 Offender has not been able to maintain continuous employment up to the offence**

This is a medium factor

*s<sub>20</sub>* — Expert quotes this factor

*a<sub>20</sub>* — There is an objective market difficulty in maintaining continuous employment. Many employers sack people in order not to give them tenure.

*b<sub>20</sub>* — This is a statistical observation. The statistics show increase in risk. The statistics does not consider the reasons behind the lack of past continuous employment.

### **3.22 Offender violated some restrictions imposed by court orders, not necessarily sexually connected**

This is a medium factor.

*s<sub>21</sub>* — Expert mentions this factor

*a<sub>21</sub>* — The past offences are not sexual, why are you mentioning them?

*b<sub>21</sub>* — The offender cannot keep to proper boundaries, and his “internal policeman” is weak. If within the boundaries of court orders the offender could not police himself, he might reoffend if we release him now.

### **3.23 Empathy towards the victim**

Weak factor

*s<sub>22</sub>* — Expert mentions this factor

*a<sub>22</sub>* — The literature shows there is no significant connection of this factor to risk.

*b<sub>22</sub>* — If there is no empathy to the victim the offender will not appreciate the damage he is doing, and will not be interested or respond well to remedial treatment.

### **3.24 Disrespect to authority and institutions**

*s<sub>22</sub>* — expert mentions this aspect

*a<sub>22</sub>* — The literature shows there is no significant connection of this factor to risk

*b<sub>22</sub>* — If offender does not respect authority, then the offender if released with disrespect the officer supervising him/her and will try to out-manoeuvre the officer and offend again

### **3.25 Medical treatment to lower the sexual drive**

This is an important factor, medium strength, as long as the patient participates

*s<sub>24</sub>* — expert mentions this.

*a<sub>24</sub>* — The Offender agrees to a chemical castration without being forced to do it. He is risking his body and might have to face side effects. This is a proof of how much he appreciates his wrong doing in the past and shows commitment to be risk free in the future. This must be considered a significant factor.

*b<sub>24</sub>* — This treatment affects the offender capabilities, not his personality and tendencies. Therefore without a genuine internal change there is still the risk of further offence, especially if the treatment is discontinued.

Furthermore the offender agreeing to the treatment may be just manipulative and not genuine, and we can be sure only if he continues with it for a considerable period of time. This is why this factor doesn't change the risk assessment in the long term..

### **3.26 No community or family support for the offender**

Low factor.

*s<sub>25</sub>* — Expert mentions this factor

*a<sub>25</sub>* — Offender can take care of himself

*a<sub>25(b)</sub>* — It is bad enough that everyone abandoned the offender, you have also to punish him for it?!

*b<sub>25</sub>* — This is not a punishment but the unfortunate fact that the offender will have no support to help him not offend again.

### **3.27 Offender is mentally retarded**

This increases risk, medium factor.

*s<sub>26</sub>* — Expert mentioned this factor

*a<sub>26</sub>* — This is God's doing, what can the offender do?

*b<sub>26</sub>* — Mental retardation leads to dis-inhibition. The offender cannot learn from experience or appreciate vague situations with unclear boundaries.

### 3.28 Mental illness

Medium factor for increase in risk

*s<sub>27</sub>* — Expert mentions this factor

*a<sub>27</sub>* — What can he do, it is not his fault.

*b<sub>27</sub>* — Mental illness leads to dis-inhibition. The offender has difficulties to learn from experience or appreciate vague situations with unclear boundaries.

We are not supposed to be politically correct but we deal in science and it is proven that mental illness increases risk of re-offending.

### 3.29 Offender does not accept responsibility for his actions nor expresses regret

Factor of low importance

*s<sub>28</sub>* — Expert mentions this factor.

*a<sub>28</sub>* — The literature does not consider this significant

*b<sub>28</sub>* — If the offender does not accept responsibility of regret he will not be interested in any change. Accordingly, his chance to integrate on treatment and to derive the usefulness from it is low.

### 3.30 Did the offender plead guilty?

This is low factor.

*s<sub>29</sub>* — Expert mentioned this factor

*a<sub>29</sub>* — A literature do not attach much importance to this factor with the possible exception of a small group of offenders.

*b<sub>29</sub>* — For offences within the family unit this is an important factor.

Furthermore, it is less likely the offender will accept treatment nor benefit from it

### 3.31 The offender has a distorted way of thinking

Low importance.

*s<sub>30</sub>* — Expert mentions this factor

*a<sub>30</sub>* — This factor is not identified in the literature. Besides, everyone has distorted ways of thinking one way or another.

*b<sub>30</sub>* — Sex offenders have their own characteristic distortions, that form the basis to rationalise and justify his offences. We know there is a connection between thinking positions and behaviour.

### **3.32 Offender has low opinion of himself**

Medium importance for increasing risk.

*s<sub>31</sub>* — Expert presents this factor.

*a<sub>31</sub>* — Person with low opinion of self the offender will not dare offend.

*b<sub>31</sub>* — On the contrary offender will not dare approach normal relationship and will find someone weak to offend and attack.

### **3.33 Offender is physically or mentally impotent or is ashamed of his sexual organs**

Factor of medium to high importance

*s<sub>32</sub>* — Expert mentions this factor as increasing risk

*a<sub>32</sub>* — On the contrary, there is no risk, he cannot do it he will not do it.

*b<sub>32</sub>* — Not at all, we are dealing with frustration as a basis for action. To prove him-self the offender might prey on the weak such as children.

### **3.34 Impulsiveness, low tolerance to stimuli**

Factor of medium importance.

*s<sub>33</sub>* — Expert presents this factor

*a<sub>33</sub>* — Usually his impulsiveness is not connected with sex

*b<sub>33</sub>* — Impulsive people are unpredictable, you cannot be sure what the offender will do.

### **3.35 Strong sex drive**

Factor of high importance for risk.

*s<sub>34</sub>* — Expert presents this factor

*a<sub>34</sub>* — So what, the offender will just be busy masturbate more often and is less likely to offend.

*b<sub>34</sub>* — Research shows that on the contrary, increase masturbation enhances existing sex drives and not diminishes them. The offender is more likely to seek real contact.

### **3.36 Sexual deviation**

Such as pedophilia, exhibitionism, proterism, etc.

Factor with high risk.

*s<sub>35</sub>* — Expert uses this factor.

*a<sub>35</sub>* — The man is sick, he needs hospital, not punishment.

*b<sub>35</sub>* — I am not a Judge, the fact is that people with sexual deviation are high risk offenders.

### **3.37 Offender completed medical treatment**

This is medium factor in reducing risk.

*s<sub>36</sub>* — Expert did not include this factor

*a<sub>36</sub>* — The offender did conclude a treatment why did you not include it as a high risk reducing factor?

*b<sub>36</sub>* — The treatment is not effective on some people. They emerge from it with some success but these fade in time. The real test is if the offender continues the program suggested by the treatment.

### **3.38 Sex offender treatment was interrupted and never completed**

High risk factor.

*s<sub>37</sub>* — expert uses this factor.

*a<sub>37</sub>* — The interruption was due to objective factors such as the offender was sent to prison and was not allowed to complete the treatment.

*b<sub>37</sub>* — Even if it is not the offender's fault the fact is that half a treatment is risky and makes the situation worse in confusing the patient.

### **3.39 Does the offender understand/ know the risk/ trigger situations? Can the offender use adaptive preventive measures?**

Medium factor

*s<sub>38</sub>* — The Expert said the offender did not know.

*a<sub>38</sub>* — The offender did know but when you talked to him he was under stress and could not list them. Anyway there is not enough research about this factor

*s<sub>38</sub>* — It is important to know the risk/ trigger situation for offence and learn to avoid them. It is important for the offender to know that even simple, seemingly unimportant decisions can put him at a risk of a trigger situation.

### **3.40 Personality disorder**

Factor of low importance.

*s<sub>39</sub>* — Expert mentions this factor.

*a<sub>39</sub>* — There is not enough research on this factor.

*b*<sub>39</sub> — Sometimes this can be the reason for the offence. For example a narcissist might think the victim actually wants sex and the offender is actually being helpful.

Personality disorders are very difficult to treat.

### 3.41 The offender has had a long prison sentence

Factor with low strength.

*s*<sub>40</sub> — Expert mentions this factor.

*a*<sub>40</sub> — Offender did not offend in prison and suffered long enough. Why don't you let go instead of continuing to support punishing him?

*b*<sub>40</sub> — I don't deal with punishment. I deal only with risk assessment. Today there is literature that indicates that having served a long prison sentence does not reduce risk but might even increase risk.

## 4 The Formal Model

The argumentation model we need is different from the traditional one, see Appendix A, and so we need to begin with an orientation discussion. We have already mentioned, at the end of Subsection 3.1, that the attack on the expert's testimony is an instance of Walton and Krabbe's [22] persuasion dialogue. The nature of the attacks in such dialogues is brilliantly studied in [21]. In the case of our expert testimony, the attacks have a numerical and informational aspects and these need to be modelled. We stress to the reader that the sex offender's risk assessment models express the risk directly with numbers. This is what the community does and this is what their tools do. It is not the case that we have arguments that get weaker by virtue of attacks and we are using numbers in our meta-language modelling to reflect that . The numbers in the sex offender case are in the object language.<sup>10</sup>

### 4.1 Orientation and discussion

The basic situation we face is that of Figure 7 (compare with Figure 5):

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<sup>10</sup>We mention in passing that Henry Prakken [28] has shown a way to simulate this weakening process, what he calls argument "accrual", using ASPIC+ and similar systems, but his approach causes an exponential blow-up in the number of arguments. The formal argumentation community, especially those members identified with the COMMA conference, are going through what we can call the "combination phase". Combine argumentation with probability, with Bayesian networks, with modal logic, with automata (not done yet),etc etc. This is reminiscent of the Fuzzy Logic community, when they went through this phase, making anything fuzzy. It is a necessary and healthy evolutionary stage which sooner or later it will be over. Our use of number is not a "combination phase" use, we simply model what the sex offender's community does.

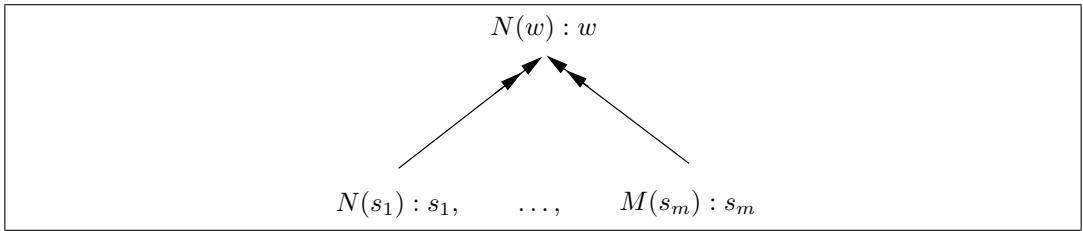


Figure 7

The node  $w$  has a numerical strength  $N(w)$  and the nodes  $s_1, \dots, s_m$  also have numerical strength  $N(s_1), \dots, N(s_m)$ . The Appendix gives some discussion of  $N(s_i)$  and  $N(w)$  and how to calculate them.

These are the numbers attached to the factors  $s_1, \dots, s_m$ , and to  $w$ . The numbers  $N(s_i)$  aggregate to give the number  $N(w)$ .

This is the first round in the expert's persuasion testimony, as represented by Figure 7. The issue is the node  $N(w) : w$ , and the support for it are the factors  $N(s_i) : s_i$ , as given by the expert. In our formal model we need to say how  $N(s_i), i = 1, \dots, m$  are joined together to yield  $N(w)$ .

The numbers  $N(x)$  can be positive, negative or zero, and fall within a range  $N^- < N(x) < N^+$  where  $N^- < 0 < N^+$ . We will see in the Appendix, for example that  $N^-$  can be  $-13$  and  $N^+$  can be  $5$  (not necessarily  $N^+ = N^-$ ). We obtain  $N(w)$  from  $\{N(s_i) | i = 1, \dots, m\}$ , via some mathematical formula. All the tools in the Appendix use the same formula: they simply add the numbers up.  $N(w)$  is the strength of the risk  $w$ .

If it is a positive natural number  $0 < N(w) \leq N^+$  it indicates the degree of the risk of the sex offender. When it is zero then there is no risk and when it is negative there is strongly no risk. The numbers  $N(s_i)$  for the factors  $s_i$  indicate an increase in risk when positive, neutral when zero and a decrease in risk when negative. All the tools of the Appendix use the mathematical formula

$$N(w) = \sum_{i=1}^{*} N(s_i)$$

where  $\sum^{*}$  is a sum function which truncates the sum at  $N^+$  when positive and at  $N^-$  when negative.

So, for example, if we have  $N^- = -13$  and  $N^+ = 5$ , then we have

- $-10 +^* 5 = -5$
- $-10 -^* 7 = -13$

- $5 +^* 3 = 5$

Before we continue any further we must issue a word of caution. The perceptive reader, especially a member of the COMMA community who is well versed with numerical argumentation, will no doubt wonder at the simplicity and naivete of this model and its numerical aggregation method. Well, this is not our (the author's) model. It is a description of what the risk assessment community do in practice, formulated/translated into argumentation language. We do this to show that there is an opportunity for the argumentation community to offer a better model. So the perceptive reader might continue and ask why don't we, the authors, offer a better model? Our answer is that the risk assessment community think like the medical community. Any new offer needs to be tested and monitored over some years. We need to talk to them extensively before we make any new model for them to use. For example the numerical ranges of the various factors are sometimes different. We need to ask and understand why this is so. At the moment we do not know why.

See Appendix C for a more detailed discussion.

Let us add here another word of caution, while we are in this mode. Some readers from community 2 might wonder whether the Abstract Dialectical Framework [30], can be of service here. We accept that the Abstract Dialectical Framework is a powerful tool gaining momentum in the community. However, the answer is no, it is not suitable. It is essentially classical propositional logic reformulated and presented as argumentation. Community 2 people are familiar with classical propositional logic and can see that it is not suitable.

Let us alert the perceptive reader to another benefit coming from the risk assessment community to the argumentation community. There is another point to be aware of. The "attacks" on the factors  $s_1, \dots, s_m$ , as practiced in court and reported by the second author, are not numerical but informational. The attack  $a_i$  on  $s_i$  sometimes asks for clarification and sometimes gives more information. The attack  $b_i$  on  $a_i$  is again just a clarifying reply. So we have here a network where the attacks are diverse, sometimes they are numerical and sometimes they are non-numerical. This gives us the new idea of the attack as information input (see [6]). It means that the traditional concepts of extension, conflict freeness and attack and defence, may not apply in our case, and we need new formal concepts to deal with such networks. We also need to explain how a node  $a$  attacks a node  $b$  by sending it information. Notice that if the information is explanatory, then this is support and we get a network with both attack and support (also called Bipolar Networks in the community (see [9] and the references there, be aware that [9] follows a long chain of previous papers by the community of argumentation)). See Appendix A for formal argumentation definitions.

We note that a numerical attack can also be regarded as informational, in the sense that it gives new numbers as new information.

So we have three problems here, the first two are under our immediate control and the third requires further consultation with the Sex Offenders community:

1. Develop networks where the meaning of the attack relation may vary in different parts of the network.
2. Explain and define the notion of informational attack, where node  $a$  attacks node  $b$  by sending it some information which may attack  $b$  or support  $b$  or may even be consistent with  $b$ , but thus changes  $b$ . We must compare with [21, 31-33]. This, however, requires a full subsequent theoretical paper.
3. Develop a better numerical model for aggregating risk for the sex offender community. See Appendix C for the challenges involved.

## 4.2 Formal presentation of the model

We are now ready for the formal machinery. We first define the traditional argumentation networks for finite acyclic graphs. These have only the traditional grounded extension. This will allow us to appreciate the next definition, that of informational argumentation network for finite acyclic graphs.<sup>11</sup>

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<sup>11</sup>Note that our models are trees of depth 4 anyway, so acyclic graphs are OK for us.

However, there seems to be an issue about the use of graphs with cycles. This issue is already raised and discussed in [21]. See [25, 26]. We quote from [21]:

“Although argument graphs are not restricted to trees, they are not completely general; we do not allow cycles. This restriction is intended to assure the decidability of the acceptability property of statements. At first sight, the condition that argument graphs be acyclic would seem to be a severe limitation. However, things are not that serious. Firstly, in systems using Dung’s approach most cycles in realistic examples are two-cycles between arguments with incompatible conclusions. In Carneades, these can be represented as a pair of arguments pro and con the same statement, which does not introduce cycles into the argument graph. Next, cycles caused by indirectly using a statement in support of itself are also excluded in many other systems. ....in Dung’s [8] abstract framework defeat graphs with odd cycles may have no stable extensions. Also, intuitions differ on the proper treatment of cycles [26]. Prior relational approaches to this problem, such as Dung’s preferred and grounded semantics as alternatives for stable semantics, are not directly transferable to Carneades, with its dialogical and procedural elements. We therefore leave an extension to graphs that allow for cycles through exceptions for future work”.

**Definition 4.1.** 1. Let  $S$  be a non-empty set and let  $R \subseteq S \times S$  be a binary relation on  $S$ . We say  $R$  is acyclic iff there does not exist a sequence  $(x_1, \dots, x_n)$  in  $S, n \geq 1$  such that

$$x_1Rx_2, x_2Rx_3, \dots, x_nRx_1.$$

2.  $x$  is said to be a source point if there is no  $y$  s.t.  $yRx$ .  $x$  is an endpoint if there is no  $y$  such that  $xRy$ .

**Proposition 4.2.** Let  $(S, R)$  be a finite acyclic graph. Then for some  $x \in S$  we have that  $x$  is a source point.

*Proof.* Assume that there are no source points. Let  $x_1 \in S$ , then for some  $x_2, x_2Rx_1$ . Similarly for some  $x_3, x_3Rx_2$ . We carry on and get a sequence  $x_1, x_2, x_3, \dots, x_n, \dots$  such that  $x_{n+1}Rx_n$ . Since  $S$  is finite, for some  $m, n, m \neq n, m < n$  we have  $x_m = x_n$ . Thus gives us a cycle  $(x_m, \dots, x_n)$ .  $\square$

**Definition 4.3.** Let  $(S, R)$  be finite acyclic. We define a Caminada  $\{0, 1\}$  labelling  $\lambda$  on  $S$  as follows.

**Step 1.** Let all source points  $x$  be labelled  $\lambda(x) = 1$ .

**Step 2.** Let  $y$  be any point such that for some  $x, xRy$  and  $\lambda(x)$  is defined in Step 1 and  $\lambda(x) = 1$ . Let  $\lambda(y) = 0$ .

$\vdots$

**Step  $2n+1$ .** Let  $x$  be any point such that  $\lambda(x)$  is not yet defined but for all  $z$ , such that  $zRx$ , we have that  $\lambda(z)$  is defined and  $\lambda(z) = 0$ . Let  $\lambda(x) = 1$ .

**Step  $2n+2$ .** Let  $y$  be such that  $\lambda(y)$  is not yet defined but for some  $z, \lambda(z)$  is defined and  $\lambda(z) = 1$ . Let  $\lambda(y) = 0$ .

Let  $S_\lambda$  be all points  $x$  such that  $\lambda(x)$  is defined at any  $n$ .

**Proposition 4.4.** 1. For the  $S_\lambda$  of Definition 4.3 we have that  $S_\lambda = S$ .

2. The function  $\lambda$  thus defined is unique.

*Proof.* 1. Let  $x_1 \in S_\lambda - S$ . Consider the set of all  $z$  such that  $zRx$ .

(a) If the set is empty then  $\lambda(x) = 1$  by Step 1 of Definition 4.3.

- (b) If the set is not empty and all its members are in  $S_\lambda$ , then if for some  $z, zRx_1$  and  $\lambda(z) = 1$  then at some stage  $\lambda(x_1)$  is defined and  $\lambda(x) = 0$ . On the other hand, if for all  $z$  such that  $zRx_1$  we have  $\lambda(z) = 0$ , then at some stage  $\lambda(x_1)$  is defined and  $\lambda(x_1) = 1$ .
- (c) Therefore there exists an element  $z$  such that  $zRx_1$  and  $\lambda(z)$  is not defined. Call this element  $x_2$ .

Assume by induction that we have  $(x_m, x_{m-1}, \dots, x_1)$  such that

$$x_m Rx_{m-1}, \dots, x_{m-1} R_{m-2}, \dots, x_2 Rx_1$$

and  $\lambda(x_j)$  are all undefined. Repeat our reasoning for  $x_m$  and get  $x_{m+1}$  for which  $\lambda(x_{m+1})$  is undefined.

Since  $S$  is finite, we have that for some  $m_1 < m_2$  we have  $x_{m_1} = x_{m_2}$ . This gives us a cycle. A contradiction. So  $S_\lambda = S$ .

2. It is clear from the construction that  $\lambda$  is unique.

□

**Example 4.5.** We use the example of a 61 year old sex offender (age factor  $s_{15}$ ) and let us present his risk sex assessment. We use one of the tools listed in the Appendix. His age scores as (-3, being the score value for  $s_1$ ). The offender attacked in a public place (factor  $s_{15}$ , value +1) and used force (factor  $s_{15}$ , value +1) to subdue a male (factor  $s_{11}$ , value +1) unrelated (factor  $s_{19}$ , value +1) and unfamiliar (factor  $s_{10}$ , value +1) victim (factor  $s_{18}$ , value +1) who was 7 years old. It was his first conviction on sexual offence (factor  $s_6$ , value 0) and in fact, his first conviction for any offence at all (factors  $s_7, s_8$ , value 0). Official documents show that he had lived with an Intimate Partner and had a joint household with a partner for a period of at 26 Years (factor  $s_3$ , value 0) and worked for at least 15 years at the same place of work (factor  $s_{20}$ , value 0).

The person successfully completed group sex offender therapy (factor  $s_{36}$ , value -2) and today he admitted to the assessor that he knows he has deviant sexual urges (factor  $s_{35}$ , value +2) but he learned adaptive coping techniques and knows how to avoid dangerous situations (factor  $s_{38}$ , value -1).

The figure for this example is Figure 8. The score values for the factors are given above and this is the information being sent to the node  $w$ . The score values sum up to +3. Section 3 lists the factors  $s_i$  and also lists  $a_i$  and  $b_i$ . the reader can see that  $a_i$  and  $b_i$  add more information.

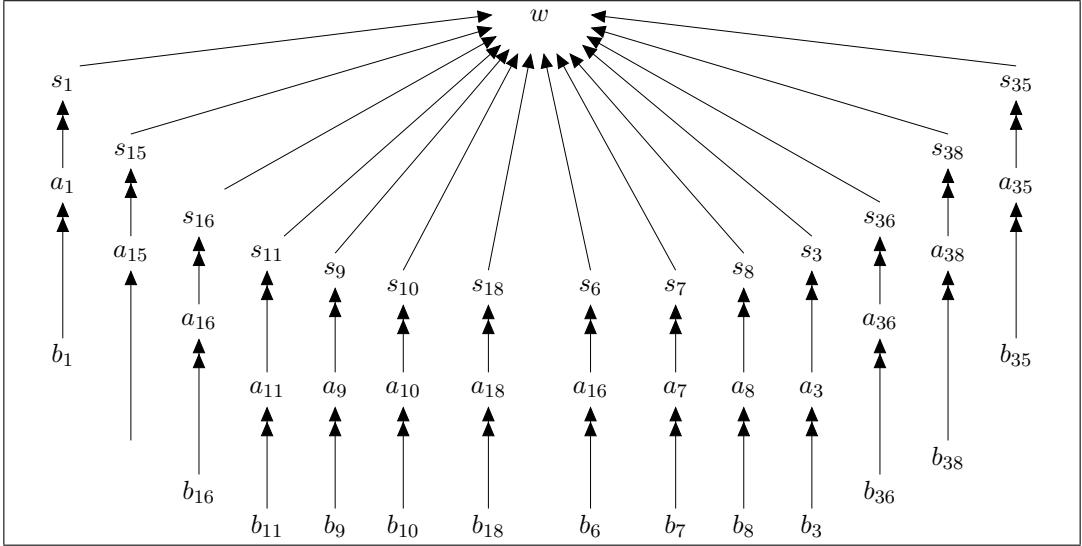


Figure 8: Figure for example 4.5

## 5 Conclusion and Discussion

We begin with an incredible observation we made while writing this paper. The sex offender international community is also a community doing therapy. They try to help the convicted sex offenders and in fact to have one's prison sentence reduced one needs to join a therapy group. The second author of our paper also has responsibility for conducting and dealing with therapy groups. The most amazing discovery we made is that the therapy uses argumentation and logic. The accepted wisdom in the sex offender community is that besides physical and all the other problems which the offenders have, they also suffer from reasoning distortions, and in order to lessen the offenders risk to society his reasoning distortion needs to be corrected.<sup>12</sup> To do this they use argumentation. We have also written paper [33] on the theory of Universal Distortions in reasoning and argumentation. This type of distortion is not restricted to sex offenders, you see it in religiously motivated terrorism, fundamentalism and more. One needs to model it and find ways to counter it.

We now turn to the current paper.

Our starting point in this paper is current research in the argumentation community on reasoning schemes, critical questions and expert opinion (see [40]), focussing

<sup>12</sup>It is amazing that in group therapy the sex offenders can identify the distortions in others but not (the same distortion) in themselves. It can take 20 months to make them see the problem.

on one of the 60 argumentation schemes in the important book [7] of D. Walton, C. Reed and F. Macagro, namely the scheme:

Scheme 2: Argument from Expert Opinion

Our approach was to look at one expert – the second author Dr G Rozenberg, an expert on assessing the risk factor of a sex offender – and see what argumentation experience he has accumulated over the years in court, and try and model it, in the spirit of [7].

We quote the hope mentioned in [7]:

“It would be very helpful for users of the schemes to have a more refined system of classification, so that the user could search through to find a scheme applicable to her needs...”

We hope that our research in this paper is indeed helpful.

The following are the main points of the process and some comments on what we found. We present it from the point of view of the argumentation community, since this community is the one to take the next step in communicating with the sex offenders community. We look at the process of expert witness for risk assessment and we see the following steps:

1. The court appoints the expert to check a specific statement witness. This is standard practice.
2. The expert writes a report and delivers to the court and the defence. Again, it is expected standard practice for the expert to produce a report, but in the sex offenders case in Israeli courts the expert must address an internationally recognised list of factors.
3. The expert is attacked by the defence on two fronts (this is recognised by Walton in a general way but has a specific form in the Israeli courts for the case of sex offenders).
  - (a) The expert is attacked personally as an expert, (see Section 2). We listed the type of questions/attacked used against the expert during his 11 years experience. Some of these we incorporated in refining the Walton scheme in Appendix B.
  - (b) The report items are attacked, (see Section 3). The form of attack and defence is stylised in Israeli court in the form of a tree of depth 4. Owing to this stylised form there is the possibility of computerising/automating the process, thus exporting a tool to the sex offender community.

4. We discovered that there is a stylised generic form of the personal attack on the expert. Some questions are about his knowledge and methodology and some are trick questions to discredit the expert personally, hoping to show for example that he is a racist, has hidden agenda, etc. We commented on some of such questions in Section 2, and added another question scheme CQ7, to Appendix B.
5. There is also a stylised form of attacks on the report. The report must address certain questions  $s_i$  which seems to be instantiations of a list of generic questions applied to the area of expertise. The expert opinion is attacked by the defence on each item  $s_i$  by the question  $a_i$  and the expert replies to the attacks by reply  $b_i$ , and that is all of it. This observation is not trivial observation: The defence is not allowed to further attack the response of the experts and more importantly the defence is expected to ask only about the ATSA recognised factors. It can bring its own expert.

To the extent that the defence bring their own expert, the defence expert follows the same steps as the court expert.

6. The two experts do not interact, that is they do not answer, attack or speak to each other. The whole parallel process is observed by the court. We need to think whether this gives us new ideas about dialogue/debate procedures.
7. When modelling what is happening, we realised that we need to use Informational attack systems, where the attack is information input [5, 6]. The information input can be attack, can be support, or can aggregate to any of the above. This is a new game for the argumentation community.
8. What is more surprising, is that the sex offender therapists community uses logic to treat sex offenders. The community is not explicitly aware of this. They regard the sex offender as suffering from reasoning distortions and proceed to actually use argumentation to try and correct such distortion and reduce the temptation to offend. Once we, the authors, realised this, we were motivated to study reasoning distortions in general, see paper [33].

What are our lessons from the above?

- The way expert opinion is handled. It is different from mere witness testimony which is not stylised and regimented. We can ask whether this stylised expert witness procedure is an example where we can have a Computerised Judge responding to a stylised computerised form filled in by the expert witness.

- We need to do similar investigation of real life/court practice for each of the 60 argument schemes of [7].
- In practice attacks are informational and so this area of argumentation needs to be further developed, as well as a serious comparison with [21, 29, 31].
- We need to examine the use of fallacies in respectable argumentation systems, especially when numerical or other aggregation is involved. We saw in some of the attacks on the expert, that some gentle hints of Ad Hominem were employed, (Questions 21, 34 and 36) even though in the Israeli stylised system, the expert was recognised. See also the trustworthiness questions in Appendix B.
- Focus more on the works of D. Walton, J. Woods and collaborators and the research of the Informal Logic/ Fallacies communities. Follow papers [21, 22, 23, 24, 27, 31, 33] and the references there.

We conclude this section and the paper by comparing with related literature.

As we remarked in Section 1, Remark 1.1, we need to compare our paper only with other papers which analyse in detail specific expert witness protocols and modellings. There are not too many such models and detailed procedures tend to be too special anyway. One aspect however, can be compared and is of great importance, and that is the use of statistical reasoning by experts. Such use is problematic, see [41, 42, 43]). Our risk assessment factors in Section 3, rely heavily on statistical packages. This has been criticised by Canadian courts

“On September 18, 2015 a Canadian court (Ewert v. Canada, 2015) strongly cautioned the continued use of five risk instruments (Hare Psychopathy Checklist Revised [PCL-R], Violence Risk Appraisal Guide [VRAG], Sex Offender Risk Appraisal Guide [SORAG], Static 99, Violence Risk Scale — Sex Offender [VRSSO]) by the Correctional Service Canada (CSC)<sup>1</sup> with Aboriginal inmates. The instruments evaluate risk for future violence (VRAG), risk for sexual violence/offending (SORAG, Static 99, VRS-SO), and the presence of psychopathic traits (PCL-R)”.

See [46].

There are three methods for assessing risk of sex offenders

1. The subjective one, by the expert/therapist. This has been criticised as being too subjective
2. The use of international statistical packages, (see Appendix C, and for example [45]).
3. A new method, *Structural clinical judgement*, can be used which benefits from the good aspects of both 1. and 2. See [47]

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## Appendices

### A Background and concepts from abstract argumentation

#### A.1 Argumentation system with attack only

This appendix presents, for the convenience of the reader, some basic concepts of what we called traditional argumentation theory. Such systems contain attacks only. We refer to such system as Argumentation with Attack only. One can also add support to the system and in this case we get systems of Argumentation with Attack and Support. We shall then explain in what way the systems required for this paper depart from the traditional ones.

There are two ways to present the semantics for argumentation with attack, the traditional set theoretical approach and the Caminada labelling approach. For the mapping connections between the two approaches, see [10]. Let us briefly quote the traditional set theoretic approach:

- Definition A.1.**
- 1. We begin with a pair  $(S, R)$ , where  $S$  is a nonempty set of points (arguments) and  $R$  is a binary relation on  $S$  (the "attack" relation).
  - 2. Given  $(S, R)$ , a subset  $E$  of  $S$  is said to be conflict free if for no  $x, y$  in  $E$  do we have  $xRy$ .
  - 3.  $E$  protects an element  $a \in S$ , if for every  $x$  such that  $xRa$ , there exists a  $y \in E$  such that  $yRx$  holds.
  - 4.  $E$  is admissible if  $E$  protects all of its elements.
  - 5.  $E$  is a complete extension if  $E$  is admissible and contains every element which it protects.

Various different semantics (types of extensions) can be defined by identifying different properties of  $E$ . For example we might define that  $E$  is a stable extension if  $E$  is a complete extension and for each  $y \notin E$  there exists  $x \in E$  such that  $xRy$  or the grounded extension as the unique minimal extension or a preferred extension, being a maximal (with respect to set inclusion) complete extension. The above properties give rise to corresponding semantics (stable semantics, grounded semantics and preferred semantics).

We can also present the complete extensions of  $A = (S, R)$ , using the Caminada labelling approach, see [10].

A Caminada labelling of  $S$  is a function  $\lambda : S \mapsto \{\text{in}, \text{out}, \text{und}\}$  such that the following holds.

(C1)  $\lambda(x) = \text{in}$  if for all  $y$  attacking  $x$ ,  $\lambda(y) = \text{out}$ .

(C2)  $\lambda(x) = \text{out}$  if for some  $y$  attacking  $x$ ,  $\lambda(y) = \text{in}$ .

(C3)  $\lambda(x) = \text{und}$  if for all  $y$  attacking  $x$ ,  $\lambda(y) \neq \text{in}$ , and for some  $z$  attacking  $x$ ,  $\lambda(z) = \text{und}$ .

A consequence of (C1) is that if  $x$  is not attacked at all, then  $\lambda(x) = \text{in}$ . Any Caminada labelling yields a complete extension and vice versa. Any  $\{\text{in}, \text{out}\}$  Caminada labelling (i.e. with no "und" value) yields a stable extension and vice versa. Set theoretic minimality or maximality conditions on extensions  $E$  correspond to the respective conditions on the "in" parts of the corresponding Caminada labellings, see [10].

It is useful to introduce a familiar story as an example, the story of the party.

**Story. The Party:** We are planning a party and we have a set  $S$  which is the maximal set of all relatives friends, colleagues, etc. who can be invited to the party. The problem is that some of them do not get along/hate some others. So we have a relation  $R$ , where  $xRy$  (which we might denote by  $x \rightarrow y$ ) means that if  $x$  is invited,  $y$  must not be invited. We get here a traditional argumentation network with attack relation  $R$ . The complete extensions are possible groups of people we can invite.

## A.2 Adding support

We now add support to the attack only networks, to get networks with attack and support. Let us denote such networks by  $(S, R, R_S)$ , where  $R_S \subseteq S \times S$  is the support relation (notation:  $xRy$  is denoted by  $x \rightarrow y$  and  $xR_Sy$  is denoted by  $x \rightarrow y$ ).

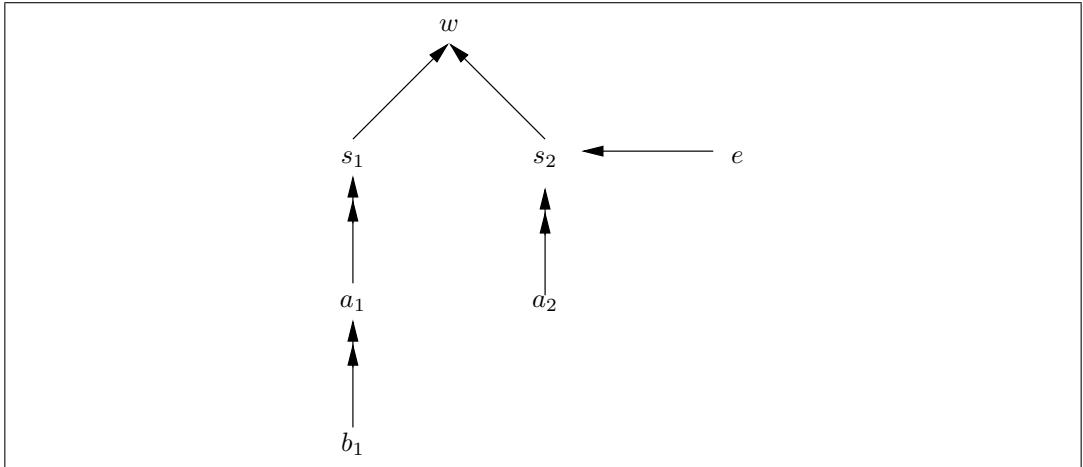


Figure 9

While there is agreement on the attack networks (*S.R*), there is no community agreement on how to handle support. See [9] for a research/survey. Systems with both attack and support are called bipolar networks. There are many proposals to give semantics to such networks. Our paper, on attack and support for the expert witness model, requires a new approach, to enable us to model how support is handled in court in this particular case.

To see our options for support, consider Figure 9

In this figure  $s_1$  and  $s_2$  support  $w$ . Consider the attack of  $a_1$  on  $s_1$ . Assume that this attack is successful. So certainly  $s_1$  is out/dead.

**Question 1.** Does this successful attack also knock out the other supporters of  $w$ , namely  $s_2$  and  $e$ ?

**Question 2.** Does  $e$  also support  $w$ , through its support of  $s_2$ ?

**Question 3.**

- i. Does  $a_2$  also attack  $e$  (because  $e$  supports  $s_2$  and  $a_2$  attacks  $s_2$ )?
- ii. Does  $a_2$  also attack  $w$ , (through its attack of its supporter  $s_2$ )?

Our first definition, Definition A.2 adopts the following view for support.

1. The support relation is reflexive and transitive.

2. We "lump" together any  $z$  and all of its supporters. To attack  $z$  you can attack either  $z$  or any of its supporters. In comparison, Definition A.2 adopts a slightly different view of support.
3. We lump together all supporters  $y$  of any  $z$ . Any attack on any  $y$  is considered an attack on all of the  $y$ s and if successful, takes out/dead all of them.

**Definition A.2.** Let  $S \neq \emptyset$  be a finite set and let  $R_A$  and  $R_S$  be two binary relations on  $S$ . The system  $(S, R_A, R_S)$  is called argumentation system with attack and support, using options 1 and 2 if the following holds:

1.  $R_S$  is reflexive and transitive. We understand  $xR_Ay$  as  $x$  attacks  $y$  (notation also  $x \rightarrow y$ ) and we understand  $xR_Sy$  as  $x$  supports  $y$  (notation  $x \rightarrow y$ ).
2. Given a system  $(S, R_A, R_S)$  and a set  $E \subseteq S$ , we say that  $E$  is conflict free iff the following holds
  - (\*) There are no  $u, x, y, z$  such that  $x, z \in E$  and  $u \rightarrow x \rightarrow y \rightarrow z$ .
  3. Let  $a \in S$  and  $E \subseteq S$ . We say that  $E$  protects  $a$  if condition  $(\#)$  holds:
    - ( $\#$ ) For any  $u \rightarrow y \rightarrow a$  there exist  $z \in E$  and  $a$  such that  $z \rightarrow v \rightarrow u$ .
  4.  $E$  is admissible if  $E$  protects all of its elements.
  5.  $E$  is a complete extension if  $E$  is admissible and contains every element it protects.
  6.  $(S, R_A, R_S)$  is attack only system if  $R_S$  is identity, ( $xR_Sy$  iff  $x = y$ ) in which case we write  $(S, R)$ .

**Definition A.3.** This definition is similar to Definition A.2 except that:

1. We do not require that  $R_S$  is reflexive nor transitive
2. We replace  $(*)$  by  $(**)$  and  $(\#)$  by  $(\#\#)$  as follows:
  - (\*\*) There are no  $x, z \in E$  such that  $x\rho z$  holds, where  $x\rho z$  iff there are  $u, y$  such that  $[x \rightarrow u$  and  $u \rightarrow y$  and  $z \rightarrow y]$  or  $x \rightarrow z$ .
  - ( $\#\#$ ) For any  $x$  such that  $x\rho a$ , there exists  $e \in E$  such that  $e\rho x$ .

**Definition A.4.** We say an argumentation network  $(S, R_A, R_S)$  is a-cyclic if the transitive closure of  $R_A \cup R_B$  contains no cycles with more than one element (equivalently it is anti-symmetric). See for example Figure 8

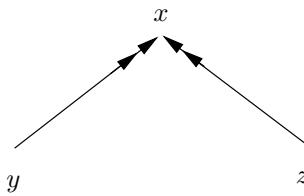


Figure 10: Informational attack

### A.3 Examples illustrating informational attacks

In this Subsection we would like to give some material illustrating informational attacks. For a full coverage see the long version of [9].

**Example A.5.** Let us tentatively consider the situation in Figure 10.

In this figure we assume that  $x, y$  and  $z$  are pieces of information and that  $y$  and  $z$  attack  $x$ . We understand the attack of any  $a$  on  $b$ , written as  $a \rightarrow b$ , to mean that we update  $b$  with information  $\tau(a)$  sent from  $a$  to  $b$ .  $\tau(a)$  is part of the information  $a$ , which is sent to attack  $b$ . We could have  $\tau(a) = a$ . We obtain a new piece of information  $b \oplus \tau(a)$  (in many cases we have  $\tau(x) = x$  and  $\oplus = \cup$  and so the result is  $b \cup a$ ).

**Remark A.6.** the idea of information update and the notation  $\oplus$  is not new. It appears in the context of the logic and semantics for substructural logics, in connection with the semantical condition and the substructural implication  $\multimap$ .

We envisage a language with atoms and  $\multimap$  and with semantical models of the form  $(S, \oplus, h)$ , where  $S$  is a set of pieces of information and  $\oplus$  is an associative and commutative binary operation (being a fancy way of writing conjunction “and” in the context of multi-sets, i.e., when we want to stress that “ $x$  and  $x$ ” is strictly more than just “ $x$ ”) and where  $h$  is the assignment to the atoms (e.g.  $h(q) \subseteq S$ ) and we let, for  $x \in S$ , satisfaction  $\models$  to be defined by

- $x \models q$ , if  $x \in h(q)$ , for  $q$  atomic
- $x \models A \multimap B$  iff for every  $y \models A$  we have  $x \oplus y \models B$ .

Here  $\tau(a) = a$ , i.e. the node  $a$  sends the complete/entire information it has to its target. In practice (witness cases) only some part or a combination  $\tau(a)$  derived from  $a$  is sent.

**Example A.7.** To give examples from substructural logics, consider the following possibilities.

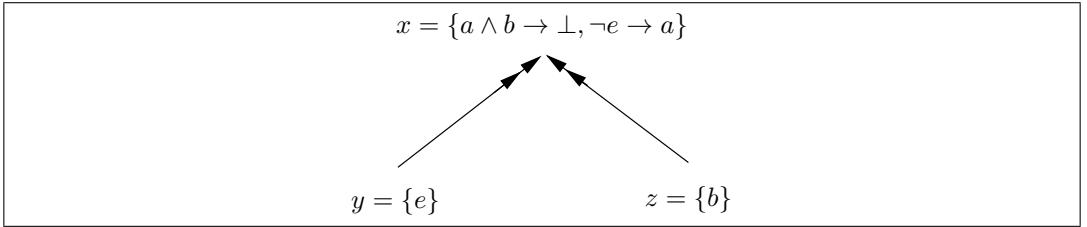


Figure 11: A logic programming example

1. If  $S$  is a family of multi sets and  $\oplus$  is multi set union then  $\multimap$  becomes linear implication.
2. If  $S$  is a family of sets and  $\oplus$  is set union then  $\multimap$  becomes relevance implication.
3. If we interpret  $\oplus$  as equality  $=$  then  $\multimap$  becomes S5 strict implication.

Thus we can use  $\oplus$  to explain the attacks in Figure 10 to mean that  $x = \tau(y) \oplus \tau(z)$  or  $x = y \oplus z$  if we let  $\tau(u) = u$ .

We need to give some examples of the use of  $\oplus$  in attack.

**Example A.8.** 1. Consider Figure 11

The nodes in Figure 11 are logic programming databases where “ $\neg$ ” is negation by failure, “ $\wedge$ ” is conjunction, and “ $\rightarrow$ ” is the logic programming implication.  $a, b, e$  are atoms and “ $\perp$ ” is falsity. The database  $x$  can derive  $a$ , we write  $x \vdash a$ . If  $x$  gets attacked by  $y$  alone, then it gets the input  $e$  and so  $\neg e$  no longer succeeds from  $x \oplus \{e\}$ , and so  $x \oplus y$  cannot derive  $a$ . If  $x$  is attacked by  $z$  alone, then we get that  $x$  gets the input  $b$  alone so we have  $x \oplus z$ , which becomes inconsistent.

If  $x$  is attacked by both  $y = \{e\}$  and  $z = \{b\}$ , then it becomes  $x \oplus y \oplus z$  which remains consistent and can derive just  $b$ .

2. To further our understanding, note that the databases  $x = \{\neg e \rightarrow a, a \wedge b \rightarrow \perp\}$  and  $x_1 = \{a, a \wedge b \rightarrow \perp\}$  are not the same, even though both derive  $\{a, a \wedge b \rightarrow \perp\}$ , because  $x_1 \oplus \{e\}$  derives  $a$  while  $x \oplus e$  does not derive  $a$ .
3. Consider now Figure 12 In this figure the node  $u$  attacks the node  $v$ . The question we ask is what information does  $u$  send to  $v$ ?

On the one hand  $u$  can derive  $a$ . So if it sends  $\{a\}$  (i.e.  $\tau(u) = \{a\}$ ), it will render  $u \oplus \tau(u)$  inconsistent, because  $v$  derives  $a \wedge b \rightarrow \perp$ .

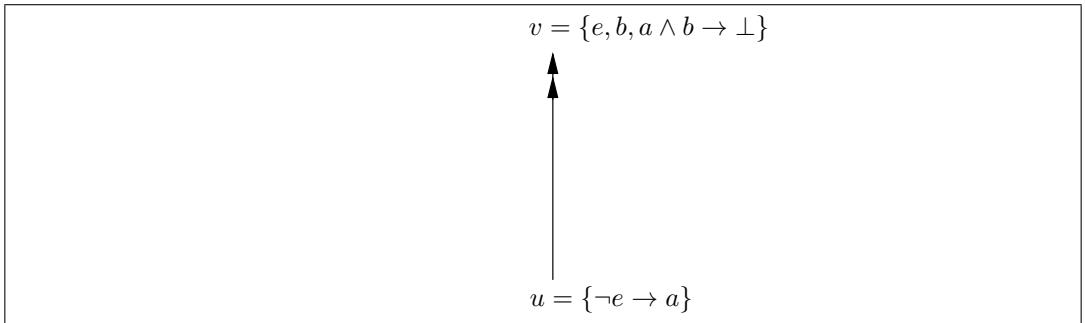


Figure 12: Second logic programming example

*But if it sends itself, namely  $\tau(u) = u$ , then  $v \oplus u$  cannot derive  $a$  and so remains consistent.*

**Definition A.9.** 1. An information system is a set  $I$  with a binary associative and commutative operation  $\oplus$  on  $I$ . Let  $\mathbf{O} \in I$  be empty information with  $x \oplus \mathbf{O} = x$  for all  $x$ .

2. Let  $(S, R)$  be a finite acyclic graph as in Definition 4.3 and let  $\mathbf{f}$  be a function giving for each point  $x$  in  $S$  a value  $\mathbf{f}(x) \in I$ .

We define an information label  $\mu(x)$ , for each  $x \in S$ , in steps, using  $\mathbf{f}$ .

**Step 1.** Let  $x$  be any source point. Define  $\mu(x)$  to be  $\mathbf{f}(x)$ .

**Step  $n + 1$ .** Let  $x$  be any point such that  $\mu(x)$  is not yet defined but for all  $z$  such that  $zRx, \mu(z)$  is defined. Then let  $\mu(x)$  be defined as

$$\mu(x) = \mathbf{f}(x) + \mu(z_1) \oplus \dots \oplus \mu(z_m)$$

where  $z_1, \dots, z_m$  are all the points in  $S$  such that  $zRx$  holds.

Let  $S_\mu$  be the set of all  $x \in S$  for which  $\mu(x)$  is defined.

**Proposition A.10.** We have for  $S_\mu$  of Definition A.9 that  $S_\mu = S$ .

*Proof.* Similar to the proof of Proposition 4.4. □

**Example A.11.** We now give a useful example of an information system labelling. Let  $(S, R)$  be acyclic graph. Regard the elements of  $S$  as atoms for constructing a logic programming information system. For each  $x \in S$  and for  $y_1, \dots, y_m$  being all

the nodes  $y$  such that  $yRx$ , construct the clause  $C_x =_{\text{def}} \neg y_1 \wedge \dots \wedge \neg y_m \rightarrow x$ . If  $x$  is a source point then let  $C_x =_{\text{def}} x$ . Consider as pieces of information as finite sets of clauses of the form  $C_x$ . Let  $\oplus$  be defined on such pieces of information as set union  $\cup$ . Consider the function  $\mathbf{f}$  on  $S$ , defined for  $x \in S$  by

$$\mathbf{f}(x) = C_x.$$

We can now consider an information system  $I$  whose elements are sets of clauses  $\{C_x\}$ , with  $\oplus$  taken as union  $\cup$ . Consider  $\mu$  defined from  $\mathbf{f}$  as in Definition A.9. We now got a special information system labelling for any acyclic  $(S, R)$ . To fully appreciate the role of this example we need to know more about logic programming. The next definitions and theorem will tell us a bit more.

**Definition A.12.** Let  $(I, \oplus)$  be an information system. Let  $Q$  be a set of atomic sentences. A function  $\pi : Q \times I \mapsto \{0, 1\}$  is called a consequence function. For  $q \in Q$  and  $x \in I$  we also write  $x \vdash_\pi q$  when  $\pi(q, x) = 1$ .

There can be various restrictions on  $\vdash$ , but we need not go into detail here. The system  $\vdash$  we use in this paper will be known and recognised as reasonable.

**Example A.13.** Let us go back to the logic programming information system labelling of Example A.11, defined for any acyclic finite graph  $(S, R)$ . Consider now  $\mu(x)$ , for  $x \in S$ .  $\mu(x)$  is a set of logic programming clauses. Let  $\vdash$  be the logic programming consequence relation. We are not defining this here, we assume it is known to the reader), see also [6]). Let  $\lambda_\mu$  be defined on  $S$  by

- $\lambda_\mu(x) = 1$  if  $\mu(x) \vdash x$ , and
- $\lambda_\mu(x) = 0$  if  $\mu(x) \vdash \neg x$ .
- If neither  $\mu(x) \vdash x$  nor  $\mu(x) \vdash \neg x$  holds we say that the value of  $\lambda_\mu$  is undecided.

The above considerations introduced a very specific  $\{0, 1\}$  labelling  $\lambda_\mu$  on  $(S, R)$  obtained from a very specific logic programming information system labelling for  $(S, R)$ . We now want to compare it with the traditional Caminada labelling  $\lambda$  for  $(S, R)$ , introduced in Definition 4.3. In fact we can prove the following Proposition (see [6]):

**Proposition A.14.**  $\lambda = \lambda_\mu$

This shows that the informational approach can simulate the traditional approach at least for the case of acyclic networks.

A detailed investigation of the informational approach can be found in the next Subsection A.4 and in [6].

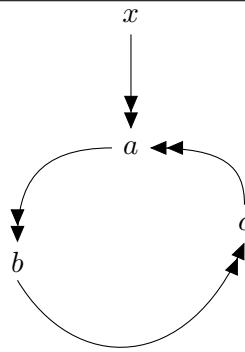


Figure 13: A cyclic graph

#### A.4 Further discussion

This section provides more explanation of the formal model.

**Example A.15.** Consider Figure 13 which will help us make a few explanatory remarks. We considered on acyclic graphs  $(S, R)$  and compared the Caminada extension labelling with the information system labelling. The graph of Figure 13 is cyclic and so is not acceptable to us. It does, however, have a unique grounded extension with Caminada labelling  $\lambda(a) = 0$ ,  $\lambda(x) = 1$ ,  $\lambda(b) = 1$ ,  $\lambda(c) = 0$ . We just do not need such a graph for analysing and modelling expert testimony and therefore we insisted on acyclic graphs for our modelling. The cycles however, could present a problem for the informational labelling because of the way these are defined. So borrowing from our paper [6], let us analyse the informational labelling approach of Definition A.9 when applied to Figure 13. We use the same  $\mathbf{f}$  as given in Example A.11. Thus we have:

- $\mathbf{f}(x) = x$
- $\mathbf{f}(a) = \neg x \wedge \neg c \rightarrow a$
- $\mathbf{f}(b) = \neg a \rightarrow b$
- $\mathbf{f}(c) = \neg b \rightarrow c$

We now define  $\mu$ .

- $\mu(x) = x$
- $$\begin{aligned} \mu(a) &= \mathbf{f}(a) \oplus \mu(x) \oplus \mu(c) \\ &= \{\neg x \wedge \neg c \rightarrow a\} \cup \{x\} \cup \mu(c) \end{aligned}$$

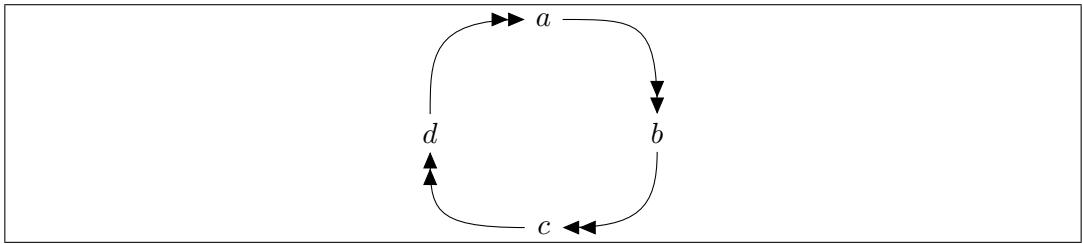


Figure 14: A four loop

- $\mu(b) = \mathbf{f}(b) \oplus \mu(a)$   
 $= \{\neg a \rightarrow b\} \cup \mu(a)$
- $\mu(c) = \mathbf{f}(c) \oplus \mu(b)$   
 $= \{\neg b \rightarrow c\} \cup \{\neg a \rightarrow b\} \cup \mu(a)$

Therefore

$$(*) \quad \mu(c) = \{\neg b \rightarrow c\} \cup \{\neg a \rightarrow b\} \cup \{\neg x \wedge \neg c \rightarrow a, x\} \cup \mu(c)$$

This can happen only if

$$(**) \quad \{\neg b \rightarrow c, \neg a \rightarrow b, \neg x \wedge \neg c \rightarrow a, x\} \subseteq \mu(c)$$

This actually happens only if we have equality in  $(**)$  because all the players' wff are participating. We therefore get that:

$$(***) \quad \mu(a) = \mu(b) = \mu(c), \text{ and } \mu(x) = x$$

Logic programming calculations will show that

$$\begin{aligned} \mu(x) &\vdash x \\ \mu(a) &\vdash \neg a \\ \mu(b) &\vdash b \\ \mu(c) &\vdash \neg c \end{aligned}$$

Therefore  $\lambda_\mu = \lambda$ , in this case also.

**Example A.16.** Consider the four cycle graph of Figure 14. let us see what extensions we get using the logic programming informational model. As before we let:

- $\mathbf{f}(a) = \neg d \rightarrow a$
- $\mathbf{f}(b) = \neg a \rightarrow b$

- $\mathbf{f}(c) = \neg b \rightarrow c$
- $\mathbf{f}(d) = \neg c \rightarrow d$

The function  $\mu$  can be calculated as before. We get:

- $\mu(a) = \{\neg d \rightarrow a\} \cup \mu(d)$
- $\mu(b) = \{\neg a \rightarrow b\} \cup \mu(a)$
- $\mu(c) = \{\neg b \rightarrow c\} \cup \mu(b)$
- $\mu(d) = \{\neg c \rightarrow d\} \cup \mu(c)$

Solving these set equations we get:

$$\mu(d) = \{\neg c \rightarrow d, \neg b \rightarrow c, \neg a \rightarrow b, \neg d \rightarrow a\} \cup \mu(d)$$

Therefore

$$\mu(a) = \mu(b) = \mu(c) = \mu(d) = \Delta$$

where  $\Delta = \{\neg d \rightarrow a, \neg a \rightarrow b, \neg b \rightarrow c, \neg c \rightarrow d\}$ . Since

$$\begin{array}{ll} \Delta \not\models a & \Delta \not\models \neg a \\ \Delta \not\models b & \Delta \not\models \neg b \\ \Delta \not\models c & \Delta \not\models \neg c \\ \Delta \not\models d & \Delta \not\models \neg d \end{array}$$

we get the whole undecided extension.

However there are two answer set models for  $\Delta$ . These are  $\{a, c\}$  and  $\{b, d\}$  and these give the other two extensions. The reader can see in [6] that in general the answer set models give all the possible extensions.

## B Refining the Walton argument schemes

We begin with an orientation, clarifying where this Appendix stands in relation to the work of Doug Walton. In their brilliant 2006 paper [7], D. Godden and D. Walton. Argument from expert opinion as legal evidence, Godden and Walton say in their abstract, we quote:

“Abstract. While courts depend on expert opinions in reaching sound judgments, the role of the expert witness in legal proceedings is associated with a litany of problems. Perhaps most prevalent is the question

of under what circumstances should testimony be admitted as expert opinion. We review the changing policies adopted by American courts in an attempt to ensure the reliability and usefulness of the scientific and technical information admitted as evidence. We argue that these admissibility criteria are best seen in a dialectical context as a set of critical questions of the kind commonly used in models of argumentation.”

The paper gives criteria for determining what is expert opinion. By comparison, in the 2008 book [6], only 6 questions are represented, (see below, namely CQ1-CQ6). Many more questions could have been included in [6], in view of [7]. We do not know the reason for the exclusion. Perhaps the authors of [6] wanted to include only questions which apply to any kind of expert testimony, and not just to the case of a legal experts. Adopting this explanation/point of view, what we do below is refine the set CQ1-CQ6, in view of the questions in Section 2, choosing those questions which we think apply to any expert. At the end of this appendix we quote more from paper [7].<sup>13</sup>

The Walton critical questions for an expert claiming A, can be refined as follows each question is presented with the refinement subquestions listed below:

**CQ1: Expertise question: How credible is *E* as an expert source?**

- \* What is your qualification?
- \* is there a structured training course that experts in your area have to take?

**CQ2: Field question: Is *E* an expert in the field that *A* is in?**

**CQ3: Opinion question: What did *E* assert that implies *A*?**

**CQ4: Trustworthiness question: Is *E* personally reliable as a source?**

- \* Surely you will agree with me that the evaluation of leading to *A* is speculative?
- \* What is the percentage of mistake?

---

<sup>13</sup>The sex offender case offers a specific detailed example of handling expert opinion. We have no doubt that Walton could address this case by defining new argumentation schemes which meet the requirements of this scenario. This Appendix informally refines Walton’s scheme for expert witness testimony, by listing sub-questions to the critical questions. We note that there is no notion of sub-questions in Walton’s conception of argumentation schemes. We do feel, however, that this is the way to go at least in this case. This is not a criticism of Walton Scheme for expert opinion, this is only a minor issue. Computational models of Walton’s conception of argumentation schemes have been developed which are capable of generating or inferring arguments. We expect that the requirements of this application scenario could have been easily met by using one of these systems to model/represent the required schemes.

- \* The time you spent on your evaluation is not enough
- \* Don't you think it is arrogant to claim that in such a short time (say "short time", whatever the time is) you can assess *A*?
- \* My client feels victimised by you
- \* Give me some examples of factors which support/attack the assessment *A* and explain why these factors are relevant and contribute.
- \* Is there different way of assessing *A*, say between Europe and America?
- \* Why did you ignore ... (find something to claim was ignored).

**CQ5: Consistency question: Is *A* consistent with what other experts assert?**

- \* Are you doing all of this alone? It is possible that someone else, had he/she been with you would have reached a different conclusion?
- \* There are research results/other reliable experts, which contradict what you are saying

**CQ6: Backup evidence question: Is *E*'s assertion based on evidence?**

- \* What are the steps taken in your evaluation leading to your expert statement *A*
- \* What method do you use?
- \* What exactly do you check? How do you put all your findings together and get a result?

**Add CQ7 Fallacies**

- \* Do you really think that your testimony makes any difference?
- \* Do you realise the damage your testimony is making?
- \* How many previous cases you had your testimony rejected?

We now quote from [7]:

"Critical Questions for Argument from Expert Opinion

1. Expertise Question: How credible is *E* as an expert source?
  - 1.1 What is *E*'s name, job or official capacity, location, and employer?
  - 1.2 What degrees, professional qualifications or certification by licensing agencies does *E* hold?
  - 1.3 Can testimony of peer experts in the same field be given to support *E*'s competence?
  - 1.4 What is *E*'s record of experience, or other indications of practiced skill in *S*?
  - 1.5 What is *E*'s record of peer-reviewed publications or contributions to knowledge in *S*?
2. Field Question: Is *E* an expert in the field that *A* is in?
  - 2.1 Is the field of expertise cited in the appeal a genuine area of knowledge, or area of technical skill that supports a claim to knowledge?
  - 2.2 If *E* is an expert in a field closely related to the field cited in the appeal, how close is the relationship between the expertise in the two fields?
  - 2.3 Is the issue one where expert knowledge in any field is directly relevant to deciding the issue?
  - 2.4 Is the field of expertise cited an area where there are changes in techniques or rapid developments in new knowledge, and if so, is the expert up-to-date in these developments?
3. Opinion Question: What did *E* assert that implies *A*?
  - 3.1 Was *E* quoted in asserting *A*? Was a reference to the source of the quote given, and can it be verified that *E* actually said *A*?
  - 3.2 If *E* did not say *A* exactly, then what did *E* assert, and how was *A* inferred?
  - 3.3 If the inference to *A* was based on more than one premise, could one premise have come from *E* and the other from a different expert? If so, is there evidence of disagreement between what the two experts (separately) asserted?
  - 3.4 Is what *E* asserted clear? If not, was the process of interpretation of what *E* said by the respondent who used *E*'s opinion justified? Are other interpretations plausible? Could important qualifications be left out?
4. Trustworthiness Question: Is *E* personally reliable as a source?

- 4.1 Is  $E$  biased?
- 4.2 Is  $E$  honest?
- 4.3 Is  $E$  conscientious?
5. Consistency Question: Is  $A$  consistent with what other experts assert?
  - 5.1 Does  $A$  have general acceptance in  $S$ ?
  - 5.2 If not, can  $E$  explain why not, and give reasons why there is good evidence for  $A$ ?
6. Backup Evidence Question: Is  $E$ 's assertion based on evidence?
  - 6.1 What is the internal evidence the expert used herself to arrive at this opinion as her conclusion?
  - 6.2 If there is external evidence, e.g. physical evidence reported independently of the expert, can the expert deal with this adequately?
  - 6.3 Can it be shown that the opinion given is not one that is scientifically unverifiable?"

The difference between the Walton Expert Witness scheme and what goes in Israeli courts can be explained as follows: In Israel senior practitioners become designated as "experts" and these can testify in court. So many of the Walton questioned do not apply to them in court. They have already been screened and vetted. The only way to attack what they say is to bring in another recognised expert. The perceptive reader might ask, if this is the case why ask questions like

- What is your qualification?
- is there a structured training course that experts in your area have to take?

Perhaps it is protocol questions or for the record? The reader should realise that these questions are what is actually asked in court. We reiterate the second author is a recognised senior expert and the data is what is actually done in court.

## C Examples of tools for assessing strength of risk factors

This Appendix quotes (we copied and pasted and edited some texts, from what is available on the internet) details about various tools which evaluate the strength of various factors discussed and assumed to be available in Section 4.

We stress that the professional literature which deals with sexual risk assessment is very diverse. It is impossible to survey and compare it all in one paper. The present paper addresses three communities, two among them are argumentation communities and so we need to give them an idea about the tools used in assessing risk of sex offenders. We therefore list the most common actuarial instruments existing in the field, which are used in different ways in different countries. In Israel, the suitability of actuarial tools was not tested and therefore, existing tools are used as tools of decision support for experts and are applied mainly to gain a view of different factors. The duty of the recognised expert is to combine the existing knowledge in the world, which is reflected also in the existing instruments, with his own experience and clinical knowledge which he has accumulated following years of practice and express his expert judgement to the court. The present paper and Appendix does not imply that we disregard the existing tools, but intends to show the reader, especially from the argumentation community, the complexity of the current situation, in which there is a multiplicity of tools. Those members of the argumentation community well versed with numerical fuzzy argumentation and T-norms will no doubt notice that the tools listed below in this appendix give numerical valuations. The risk assessment community use naive averaging to combine them. The argumentation community can improve the tools and help.

We can offer to use logical argumentation super-tools for combining the existing tools into one simple and effective integrative tool, which can be used for decision support for experts. We recommend and ask that the argumentation community take the challenge and develop such tools. Note however, that the risk assessment community, just like the general medical community (facing a new medicine or drug) will take their time and will test the tool and conduct statistical analyses to test the suitability and success rate of the proposed tool to the sex offender population in different countries and different populations of sex offenders.

Sex offenders are different from each other in their character as well as in the nature of their offenses. We have given a list of the main factors that influence the decision of the expert regarding the risk assessment of the offender, and basically all of these factors are measurable, (as we have pointed out and presented). Each of the factors is addressed when it is relevant to the sex offender or if it helps characterize his offense and if it helps determine his degree of risk. As we wrote, we do not claim that tools presented can over-ride the discretion of the expert or his risk estimates, but the tool is used only to be decision support tool. (This is the case in Israel but there are other countries where these international tools carry much more weight and cannot be easily disregarded by the expert.) Of course, if we see in a sex offender case a factor which are not quantifiable, or such that no existing tool seems to apply to them, then it is up to the expert to decide what weight to

give to such factors

On the practical level, the expert writes his opinion and presents it to the court and refers to all the relevant factors. The opinion contains several key parts.

A. Details information about the offenders past and personal life (school, social relationships, marriage, military, work, etc.).

B. Description of the offenses.

C. Description of the interview with the sex offender, his attitude to his offenses and a description of his sexual habits, which includes fantasies, whom he is attracted to, the frequency of sexual intercourse, the intensity of his sexual impulses.

D. Clinical impressions, which includes an explanation by the expert of his view of why the offender offended and what underlies his offenses.

E. Risk evaluation, including references to such factors of static and dynamically nature relating to the offender.

F. In conclusion the expert summarizes all relevant factors and gives a final risk assessment of the offender.

The judge or defense lawyer is allowed not to agree with some specific this or that factor addressed by the expert or indeed can disagree with any of the expert's conclusion and then the expert to explain any factor and a factor and the debate continues in the form explained in Section 3

### **Tool 1: Static-2002 (Hanson, Helmus, & Thornton, 2010)**

#### **Static sex offender risk assessment instrument**

The Static-2002R is based on static (unchanging) risk factors which predict the potential for sexual re-offending. This risk assessment instrument is required by law to be used by the California Department of Corrections and Rehabilitation to assess every eligible sex offender prior to release on parole; by Probation, to assess every eligible sex offender pre-sentencing and on a probation case load; and by Department of State Hospitals, prior to release of an eligible sex offender from a DSH institution. A validation study of the Static-99 risk assessment instrument, which is used to score risk of sexual re-offence by California sex offenders, shows that Static-99 assessments are very accurate in predicting sexual re-offence by a diverse California sex offender population. The first 5 years of this study is described in the Journal of Threat Assessment and Management (2014), Vol. 1, No. 2, at pp. 102-117. The California Department of Justice partnered with the SARATSO Committee to do this study. The second five years of the study will be published in 2017. The Static-99 was found to be very accurate in predicting who would reoffend in California, predicting who would commit a new sex offence in about 82% of cases. High risk offenders had

a recidivism rate of over 29%, while low risk offenders had a recidivism rate of only 1.6%. The article also describes a California SARATSO inter-rater reliability study which shows that inter-rater reliability in scoring the Static-99R is good.

Example of scoring from static- 2002 sexual assessment tool<sup>14</sup>

CATEGORY I: AGE (Score -3 points to 1 point)

**Age at Release.** The Basic Principle: The rates of almost all crimes decrease as people age (Hirschi & Gottfredson, 1983; Sampson & Laub, 2003). Sexual offending does not appear to be an exception. Most studies have found that older sexual offenders are lower risk to reoffend than younger sexual offenders (Barbaree & Blanchard, 2008; Hanson, 2002,). 2006 Research has found that the original Static-2002 did not fully account for age at release and that a new age weighting had greater predictive accuracy (Thornton, Helmus, & Hanson, 2009). With the new age weighting (used in this item), age at release no longer significantly contributed to the prediction of sexual recidivism.

**Information Required to Score This Item.** To complete this item the evaluator should confirm the offender's birth date from official records if possible or have other knowledge of the offender's age through collateral report or offender self-report. The Basic Rule: Score -3 to 1 point depending on the age of the offender, referencing the table below.

AGE	SCORE
18 to 34.9	= 1
35 to 39.9	= 0
40 to 59.9	= -1
60 or older	= -3

Under certain conditions, such as anticipated release from custody, the evaluator may be interested in an estimate of the offender's risk at some specific time in the future. Static-2002R may be scored months before the offender's release to the community and the offender may advance an age scoring category by the time he is released. For assessing risk in the future consider what his age will be on the date of release. In this case, you calculate risk based upon age at exposure to risk. Sometimes the offender's release date may be uncertain. For example, he may be eligible for parole but does not qualify for release due to an inadequate release

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<sup>14</sup>Static-2002R: Revised Age Weights Helmus, L., Babchishin, K. M., Thornton, D., & Hanson, R. K. (2009-10-08) Replaces Age Item in Official Static-2002 Coding Rules (Phenix, Doren, Helmus,Hanson, & Thornton, 2009.

plan. In these cases it may be appropriate to use some form of conditional wording indicating how his risk assessment would change with a delayed release date.

## **STATIC-2002R CODING**

### **ITEMS**

#### 1. Age at Release

18 to 34.9	=	1
35 to 39.9	=	0
40 to 59.9	=	-1
60 or older	=	-3

### **PERSISTENCE OF SEXUAL OFFENDING**

#### 2. Prior Sentencing Occasions for Sexual Offences.

No prior sentencing dates for sexual offences	=	0
1 Sentencing Occasions	=	1
2, 3 Sentencing Occasions	=	2
4 or more Sentencing Occasions	=	3

#### 3. Any Juvenile Arrest for a Sexual Offence and Convicted as an Adult for a Separate Sexual Offence

No arrest for a sexual offence prior to age 18 = 0  
Arrest prior to age 18 and conviction after age 18 = 1

#### 4. Rate of Sexual Offending.

Less than one sentencing occasion every 15 years = 0

One or more sentencing occasions every 15 years = 1

Persistence Raw Score (subtotal of Sexual Offending)

Rate of Sexual Offending		Label
0	=	0
1	=	1
2, 3	=	2
4, 5	=	3

## **DEVIANT SEXUAL INTERESTS**

5. Any Sentencing Occasion For Non-contact Sex Offences:

No = 0  
Yes = 1

6. Any Male Victim:

No = 0  
Yes = 1

7. Young, Unrelated Victims

Does not have two or more victims age less than 12 years, one of them unrelated = 0  
Does have two or more victims age less than 12 years, one must be unrelated = 1.

## **RELATIONSHIP TO VICTIMS**

8. Any Unrelated Victim:

No = 0  
Yes = 1

9. Any Stranger Victim:

No = 0  
Yes = 1

## **GENERAL CRIMINALITY**

10. Any Prior Involvement with the Criminal Justice System

No = 0  
Yes = 1

11. Prior Sentencing Occasions For Anything:

0-2 prior sentencing occasions for anything = 0  
3-13 prior sentencing occasions = 1  
14 or more prior sentencing occasions = 2

12. Any Community Supervision Violation:

No = 0  
Yes = 1

13. Years Free Prior to Index Sex Offence:

- More than 36 months free prior to committing the sexual offence that resulted in the index conviction AND more than 48 months free prior to index conviction = 0
- Less than 36 months free prior to committing the sexual offence that resulted in the index conviction OR less than 48 months free prior to conviction for index sex offence = 1

14. Any Prior Non-sexual Violence Sentencing Occasion:

No = 0  
Yes = 1

General Criminality raw score (subtotal General Criminality items)

Arrest/charges/Convictions	label
0	= 0
1, 2	= 1
3, 4	= 2
5, 6	= 3

General Criminality SUBSCORE

TOTAL -3 to 12

TRANSLATING STATIC-2002R SCORE INTO RISK CATEGORIES

Score Label for Risk Category		
-3 through 2	=	Low
3, 4	=	Low-Moderate
5, 6	=	Moderate
7, 8	=	Moderate-High
9 plus	=	High

## **Tool 2 : STABLE-2007/ACUTE-2007 (SARATSO Instrument for Dynamic Risk Assessment)**

The Stable-2007/Acute-2007 was adopted by the SARATSO Committee in September 2013 as the new dynamic risk assessment instrument. The Stable-2007/Acute-2007 is scored by certified treatment providers working with sex offenders on probation or parole. (Pen. Code, sec. 290.09.) These tools measure dynamic (changing) risk factors which are empirically related to the risk of re-offence, and are evidence-based risk assessment tools. Dynamic risk assessment supplements the static risk assessment now done in California using the Static-99R, and gives a better picture of the overall risk of re-offence presented by sex offenders on supervision. The STABLE is predictive of the risk of future sexual offending.

## **Tool 3 The RRASOR (Hanson, 1997)**

This is an actuarial instrument designed to measure risk of sexual recidivism. Scores range from 0 to 6, with a higher score indicating greater risk of sexual recidivism. It has four items: (1) prior sexual offences, (2) any unrelated victims, (3) any male victims, and (4) offender is less than 25 years of age. For the current study, the items of Static-99 were used to compute the RRASOR. The coding rules for the items of the RRASOR and Static-99 are identical with the exception of prior sexual offences. Specifically, unlike the RRASOR, the coding rules of Static-99 do not count pseudo-recidivism as prior sexual offences. Pseudo-recidivism is estimated to affect approximately 5% of offenders (Phenix, Doren, Helmus, Hanson, & Thornton, 2009), and hence, the difference between using the item scoring of Static-99 rather than RRASOR is expected to be minimal. In the development study, the RRASOR differentiated sexual recidivists from nonrecidivists with an Area Under the Curve (AUC) of .71 (Hanson, 1997). A recent meta-analysis conducted by Hanson and Morton-Bourgon (2009) found that the RRASOR showed similar, although slightly smaller effects, when averaged across 34 diverse follow-up studies (weighted mean  $d = 0.60$ , 95% CI = 0.54 to 0.65,  $N = 11,031$ ,  $k = 34$ ; which translates to an AUC of .66, 95% CI = .65 to .68).

## **Tool 4 :MnSOST-R**

This item describes the development, reliability, and validity of the Minnesota Sex Offender Screening Tool D Revised (MnSOST-R), as well as recommended risk levels and cut scores. Variables from multiple dimensions, both static and dynamic, were reviewed for inclusion in the MnSOST-R. Final items were selected and scored

empirically based on clearly defined criteria. The resulting 16 items that comprise the MnSOST-R maximize the positive predictive power of the tool, and perform significantly better than previous versions of the MnSOST. This newest version correlate achieves impressive hit rates with rapists and extra-familial sex offenders, the population for which the instrument was developed. Very high true positive rates were achieved depending on the selected cut score.

### **MnSOST-R Item Scores**

Number Item Description Item Score  
Static/Historical Items

1. Number of sex/sex-related convictions (including current conviction):

One = 0  
Two or more = +2

2. Length of sexual offending history:

Less than one year = 1  
One to six years = +3  
More than six years = 0

3. Was the offender under any form of supervision when they committed any sex offence for which they were eventually charged or convicted?

No = 0  
Yes = +2

4. Was any sex offence (charged or convicted) committed in a public place?

No = 0  
Yes = +2

5. Was force or the threat of force ever used to achieve compliance in any sex offence (charged or convicted)?

No force in any offence = -3  
Force present in at least one offence = 0

6. Has any sex offence (charged or convicted) involved multiple acts on a single victim within any single contact event?

No = -1  
Yes = +1

7. Number of different age groups victimized across all sex/sex-related offences (charged or convicted):

Age group of victims: (check all that apply)  
 Age 6 or younger  
 Age 7 to 12 years  
 Age 13 to 15 years and the offender is more than five years older than the victim  
 Age 16 or older

No age group or only one age group checked 0

Two or more age groups checked +3

8. Offended against a 13- to 15-year-old victim and the offender was more than five years older than the victim at the time of the offence (charged or convicted):

No = 0  
Yes = +2

9. Was the victim a stranger in any sex/sex-related offence (charged or Convicted)?

No victims were strangers = -1  
At least one victim was a stranger = +3  
Uncertain due to missing information = 0

10. Is there evidence of adolescent antisocial behaviour in the file?

**REASONING SCHEMES, EXPERT OPINION AND CRITICAL QUESTIONS**

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No indication	=	-1
Some relatively isolated antisocial acts	=	0
Persistent, repetitive pattern	=	+2

11. Pattern of substantial drug or alcohol abuse (12 months prior to arrest for instant offence or revocation):

No	=	-1
Yes	=	+1

12. Employment history (12 months prior to arrest for instant offence):

Stable employment for one year or longer	=	-2
Homemaker, retired, full-time student in good standing, or officially disabled	=	-2
Part-time, seasonal, unstable employment	=	0
Unemployed or significant history of unemployment	=	+1
File contains no information	=	0
Dynamic/Institutional Items		

13. Discipline history while incarcerated (does not include discipline for failure to follow treatment directives):

No major discipline reports or infractions	=	0
One or more major discipline reports	=	+1

14. Chemical dependency treatment while incarcerated:

No treatment recommended / Not enough time / No opportunity	= 0
Treatment recommended and successfully completed or in program at time of release	= -2
Treatment recommended but offender refused, quit, or did not pursue	= +1
Treatment recommended but terminated by staff	= +4

15. Sex offender treatment history while incarcerated:

No treatment recommended / Not enough time / No opportunity	= 0
Treatment recommended and successfully completed or in program at time of release	= -1
Treatment recommended but offender refused, quit, or did not pursue	= 0
Treatment recommended but terminated	= +3

16. Age of offender at time of release:

Age 30 or younger	= 1
Age 31 or older	= -1

Presumptive Risk Levels and Associated MnSOST-R Cut Scores  
Presumptive Risk Level MnSOST-R Score

Low	= 3 and below
Moderate	= 4 to 7
high	= 8 and above
Refer to county attorney	= 13 and above.

## T001 5 The Sex Offender Risk Appraisal Guide (SORAG)

This is a 14-item actuarial scale designed to predict violent, including hands-on, sexual recidivism among men who have committed at least one previous hands-on sexual offence.

Table 1. Items and basic coding rules of the SORAG (Quinsey et al., 2006)

Item Num- ber	Risk Factor	Coding Rule
1	Lived with both biological parents to age 16 (except for death of parent) D Score <i>no</i> if offender did not live continuously with both biological parents until age 16, except if one or both parents died. In case of parent death, score as for yes	Yes = -2 No = +3
2	Elementary school maladjustment (up to and including Grade 8)	No problems = -1 Slight or moderate problems = +2 Severe problems = +5
3	History of alcohol problems D Allot one point for each of the following: alcohol abuse in biological parent, teenage alcohol problem, adult alcohol problem, alcohol involved in a prior offence, alcohol involved in the index offence	0 = -1 1 or 2 = 0 3 = +1 4 or 5 = +2
4	Marital status (or lived common law in the same home for at least 6 months) D At time of index offence	Ever married = -2 Never married = +1
5	Criminal history score for convictions and charges for nonviolent offences prior to the index offence (from the Cormier-Lang system)	Score 0 = -2 Score 1 or 2 = 0 Score of 3 or above = +3
6	Criminal history score for convictions and charges for violent offences prior to the index offence (from the Cormier-Lang system)	Score 0 = -1 Score 2 = 0 Score of 3 or above = +6

Item Number	Risk Factor	Coding Rule
7	Number of convictions for previous sexual offences (pertains to convictions for sexual offences that occurred prior to the index offence) D Count any offences known to be sexual, including, for example, indecent exposure 0 = -1	1 or 2 = +1 § 3 = +5
8	History of sex offences against girls under age 14 only (includes index offence; if offender was less than 5 years older than victim, always score +4)	Yes = 0 No = +4
9	Failure on prior conditional releases (includes parole violation or revocation; breach of or failure to comply with recognizance or probation; bail violation; and any new charges, including the index offence, while on a conditional release)	No = 0 Yes = +3
10	Age at index offence (at most recent birthday)	$\geq 39 = -5$ $34-38 = -2$ $28-33 = -1$ $27 = 0$ $18-26 = +2$
11	Meets DSM-III criteria for any personality disorder	No = -2 Yes = +3
12	Meets DSM-III criteria for schizophrenia	No = -3 Yes = +1
13	Phallometric test results	All indicate nondeviant sexual preferences = -1 Any test indicates deviant sexual preferences = +1
14	Hare Psychopathy Checklist D Revised score (PCL-R; Hare, 1991)	$\leq 4 = -5$ $5-9 = -3$ $10-14 = -1$ $15-24 = 0$ $25-34 = +4$ $\geq 35 = +12$

## Tool 6 : Sexual Violence Risk-20

Douglas R. Boer, PhD, Stephen D. Hart, PhD, P. Randall Kropp, PhD, and Christopher D. Webster, PhD. The SVR-20 is a 20-item checklist of risk factors for sexual violence that were identified by a review of the literature on sex offenders; factors assessed include psychosocial adjustment, history of sexual offences, and future plans.

- Specifies which risk factors should be assessed and how the risk assessment should be conducted.
- The list of risk factors is empirically related to future sexual violence, useful in making decisions about the management of sex offenders, nondiscriminatory, and comprehensive without being redundant.
- Appropriate for use in cases in which an individual has committed, or is alleged to have committed, an act of sexual violence, including pretrial release decisions, presentence assistance to judges, development of treatment programs at correctional intake, prior to discharge to assist in post-release management, custody/access assessment, determination of need for a community warning, quality assurance or critical incident reviews, and education and training.

The SVR-20 is probably the most commonly used SPJ instrument for the risk assessment of sexual offenders<sup>5</sup>. Boer and Hart (2009) stated that 'the SVR-20 has been evaluated by a variety of researchers in a variety of sites and is the best-validated SPJ for the risk assessment of sexual offenders' (p. 346). The SVR-20 is a structured clinical guideline for the assessment of risk for sexual violence in adult sex offenders designed by a group of forensic scientists who had already done research on SPJ for other offender subgroups. The SVR-20 was developed from a thorough research of the empirical literature and using the clinical expertise of a number of clinicians. In order to identify relevant risk factors, there were three general principles: The risk factor has to be (a) supported by scientific research, (b) consistent with theory and professional recommendations, and (c) legally acceptable, that is, consistent with human and civil rights. The SVR-20 consists of 20 items, divided into three domains (see Table 1). The authors developed a manual and worksheets, in order to support a reliable application of the instrument. The administration of the SVR-20 can be divided into three general steps of the risk assessment process: First, the 20 items, as well as any additional case-specific risk factors have to be coded by an experienced forensic clinician. The items are rated using a 3-point ordinal rating scale as definitely present, possibly or partially present, or absent. In the second step, the evaluator indicates for each present risk factor whether there has been any

Domain	Risk Factor
Psychological Adjustment	1. Sexual deviance 2. Victim of child abuse 3. Psychopathy 4. Major mental illness 5. Substance use problems 6. Suicidal/homicidal ideation 7. Relationship problems 8. Employment problems 9. Past nonsexual violent offences 10. Past nonviolent offences 11. Past supervision failure
History of Sexual offences	12. High density 13. Multiple types 14. Physical harm 15. Weapons/threats 16. Escalation in frequency or severity 17. Extreme minimisation/denial 18. Attitudes that support or condone
Future Plans	19. Lacks realistic plans 20. Negative attitude toward intervention

Table 1: The Risk Factors and Items of the Sexual Violence Risk-20 (SVR-20; Boer et al., 1997)

recent change in the status of that factor within a flexible time frame. Changes are also coded on a 3-point ordinal rating scale in terms of exacerbation, no change, or amelioration. In the final step, users make a final judgement about the risk of future violence using again a 3-point ordinal rating scale. The final risk judgement should be rated as low, moderate, or high which is also indicating the degree of intervention required in this individual case. For example, a final judgement of high risk would indicate an urgent need to develop and start a comprehensive risk management plan for the individual which would feature more resources than in case of moderate or low risk.

## Tool 7 : STABLE-2007

This is a structured scale for identifying factors useful in the treatment and community supervision of sexual offenders. This presentation will offer an overview of the development of STABLE- 2007, and go on to review the research concerning its reliability and validity. Evidence concerning rating reliability has been mixed. The rater reliability for the total scores is high ( $ICC > .90$ ) among trained evaluators working on the same team. However, poor rater reliability has been observed when (continued on next page) raters lacked opportunity for common training and calibration. Even among well-calibrated teams, exact agreement is rare. The standard error of measurement is about 1.5 points, meaning that raters are expected to be within about 4.0 points 80% of the time. Evaluators need to consider this measurement error when interpreting individual results, and base their conclusions on the plausible range of “true” scores. Of the 13 content areas assessed by STABLE-2007, 9 can be considered empirically-supported risk indicators for sexual recidivism, as defined by  $d > .15$  when aggregated across 3+ studies (Mann, Hanson & Thornton, 2010). Three of the STABLE-2007 content areas are promising (aggregated  $d > .15$  based on 1 or 2 studies). One factor, Social Rejection/Loneliness, was a significant predictor in the STABLE-2007 development study but not in other research. In addition, there is one factor that was non-significant in the STABLE-2000/2007 development study, but should now be considered empirically supported, namely Child Molesters Attitudes ( $d = .46$ , based on 5 studies,  $n = 781$  child molesters). To date, there have been 3 independent replications of STABLE-2000 and 1 independent replication of STABLE-2007. Overall, these studies have found levels of predictive accuracy similar to those observed in the validation study. However, a re-analysis of the original validation study indicates that STABLE- 2007 did not work well for sexual offenders of Aboriginal heritage ( $AUC = .58$  vs.  $.71$  for non-Aboriginal). Finally, recent research on the construct validity of the STABLE-2000 and STABLE-2007 items (e.g., Nunes & Babchishin, 2012), with a particular focus on the interpretation of Emotional Identification with Children (McPhail, Hermann et al., 2011) will be presented.

<b>Stable 2007</b>	<b>Assessment ID:</b> DOCH-STABLE-84 <b>Assessed:</b> 7/11/2008 <b>Name:</b> John Doe (SID #: A0980003)
<b>DOB:</b> 06/04/2057 <b>Sentence Date</b> 10/09/1982 <b>Unit:</b> Intake Svc. Center	
<b>Gender:</b> Male <b>offence Type:</b> Indecent exposure <b>County:</b> Hawaii	
<b>Assessor:</b> susan@cyzap	<b>Assessment Status:</b> Pre-trial
<b>Purpose:</b> Initial Assessment	<b>Disposition:</b> Pre-trial
<b>Case number:</b> 733272	
<b>Scoring Form</b>	<b>Score</b>
<b>1. Significant Social Influences</b> A. Number of positive influences (max 8) B. Number of negative influences (max 7) C. Number of neutral influences D. Total significant social influences	2
<b>2. Capacity for stable relationships</b> A. Ever lived with an intimate partner for at least two years? B. Currently living with an intimate partner	No Yes with concerns
<b>3. Emotional identification with children</b> Any child victims less than 14 years?	No N/A
<b>4. Hostility toward women</b> <i>Notes:</i> Extreme hostility	2
<b>5. General social rejection</b> <i>Notes:</i> anti-social	2
<b>6. Lack of concern for others</b>	2
<b>7. Impulsive</b>	2
<b>8. Poor problem solving skills</b>	2
<b>9. Negative emotionality</b>	2
<b>10. Sex drive/sex preoccupation</b>	2
<b>11. Sex as coping</b>	1
<b>12. Deviant sexual preferences</b>	0
<b>13. Cooperation with supervisor</b>	1
Total score	20
Risk category	High

Table 2: Interpretive Ranges: 0–3 = Low, 4–11 = Moderate, 12+ = High