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THE NEED FOR CRITICAL THINKING IN EVALUATION OF INFORMATION: CRITERIA, PRINCIPLES AND RESPONSIBILITY

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1998

Paper presented at the 18th International Conference on Critical Thinking, Rohnert Park, USA, August 1-4, 1998. Bo Edvardsson is an assistant professor at the University of Örebro.

Introduction

In everyday life, work life, politics, administration, education, scientific research, and other areas, information is often uncritically accepted. Information is often without evidence or proof thereof assumed to be true or of high certainty. But individuals occasionally also use common sense and experience to reject sources and information - at times on a sound basis and at times on biased grounds. Evaluation of sources and information has been necessary throughout human evolution and history in order to survive, and it still is necessary. At times severe damage, human suffering, and high cost result when sources and information have not been critically examined. In some cases media or public authorities can persecute individuals using unreliable or even false information. Sometimes the damage caused by information of poor quality is of a more subtle nature, e. g. in the quality of human relationships, lost trust in the authorities or in the democratic process and in generation of gossip or faulty belief systems and myths. Citizens who are affected sometimes use counter strategies, e. g. attacking authorities on correct or faulty grounds. The damage caused can have many repercussions.

Based on the research in a project in investigative methodology and extensive experience from professional work and politics I have come to some conclusions about professional information in Sweden. For research purposes we are permitted to study nearly all kinds of data in the archives of the Swedish authorities. A few examples of the observations made will be given here.

One conclusion is that most of the information in hundreds of child protection investigations and child psychiatric investigations that I have seen is unreliable or faulty. The factual basis for the statements is often not shown and often does not seem to exist. Sources are often not mentioned and the information is so vague that it is not comprehensible. Personal data is, as a rule not checked with the parties concerned. Criticized or accused parties have, as a rule, not been given the opportunity to comment on the data presented against them.

Most of approximately 150 police interrogations of children (they are videotaped in Sweden) that I have analyzed or read contain large amounts of faulty strategies and techniques, e. g. only seeking confirmatory information, use of presupposing or leading

questions and other kinds of cues (see e. g. Edvardsson, 1995). In most statements from child psychiatry that I have read it is evident that most Swedish child psychologists and child psychiatrists do not realize these faulty strategies and faulty questioning when they in expert witness statements comment on the interrogations. When they describe their own questions in the expert witness statements it is evident that they themselves also use many presupposing or leading questions. They evidently do not understand the problems of validity and reliability of their own investigative procedures.

Swedish courts often do not have the analytical capability to detect the poor data quality. Undoubtedly, there is great risk for faulty decisions made by the courts.

At the university education level there are many textbooks that contain information that should be viewed more as based on ideology or belief systems than on scientific evidence that has been critically examined, but this situation certainly differs much from one course to another. The situation is aggravated when some university teachers use these textbooks uncritically. Within the social and behavioral sciences there are often problems with the quality of information, e. g. in experiments, observations, interviews, questionnaires and in information found in documents. The way in which these data quality problems are handled according to my experience is often as described by two Swedish historians (Hesselgren & Horgby, 1993):

"After having accounted for the kind of material used, the author points out some shortcomings in the information, whereafter he/she quickly leaves this area and goes on in the investigation without taking into any significant consideration the statements made earlier."

In the social and behavioral sciences statistical analyses are often very advanced and yet at the same time naive concerning the meaning or quality of the data. The risk for a "garbage in - garbage out" situation is sometimes overwhelming. For example we often do not know whether people correctly report their memories, thoughts, opinions, feelings or actions in interviews, questionnaires or documents. As a comparison many historians do not accept interview data and oral history research is controversial. Several researchers have pointed out the need for a more thorough attention to and analysis of textual information in the behavioral sciences. Esterson (1993), Macmillan (1991), Scharnberg (1993) and Wolpe & Rachman (1960) have scrutinized psychoanalytic evidence and Scharnberg (1996) has analyzed allegations and evidence of child sexual abuse. Samelson (1980) has discussed the lack of critical scrutiny in the scientific community concerning Watson's little Albert and Cyril Burt's twins (see also Hansson & Tuvevsson, 1996). Sjöberg (1997) strongly criticized the lack of critical scrutiny among Swedish psychology professors concerning the reasoning and methods used by Swedish psychologists. Edvardsson (1996, 1997ab) criticized the handling of information and reasoning among Swedish social workers, psychologists and psychiatrists.

Problems with the quality of information within media, advertising, propaganda and politics, are so well known that I will not comment upon them here.

The purpose of this paper is to argue that we all should take a larger responsibility for critical evaluation of information and to point out some criteria and principles for doing this.

"Criticism of sources": definition and history

According to the Swedish historian Torstendahl (1978, p 89) "criticism of sources" (Swedish: "källkritik") is defined as "the critical tests the historian uses to decide if historical statements are of scientific value for a certain purpose or not". Torstendahl and other Scandinavian historians speak of "criteria for criticism of sources". These criteria give "a scientific basis for suspecting that some statements can be false. On the other hand one cannot often claim that the rejected statements are false".

Torstendahl states that "Criticism of sources is a screening procedure. It does not say that the statements that survive this procedure must under all circumstances be true. Instead it means that a scientifically based suspicion of falseness is directed toward some statements. These should therefore not be used to answer the question" (p 102f).

Another Swedish historian, Odén, has in the Swedish National Encyclopedia reviewed the history and ideas of "criticism of sources". She mentions that there was a critical attitude to written and oral sources already among the ancient European historians. For instance Thukydides discussed the reliability of different accessible information. The interest in criticism of sources increased during the 17th century as methods for textual criticism were developed in Belgium to ascertain if documents were authentic or false. The rational historical analyses during the 18th century introduced rational criticism against absurdities in the source information. Leopold von Ranke founded a more strict empirically based historical research with evaluation of sources. Documents were given greater confidence than oral narratives and primary sources were preferred over secondary sources. The criticism of sources was developed further during the later part of the 19th century, especially concerning narratives. The dependency between different such sources became a main question. Around 1900 there was a German form of criticism of sources, described in a book of methods by Ernst Bernheim. Soon after that, a French criticism of sources was developed by Charles Victor Langlois and Charles Seignobos. Around the middle of the 20th century there arose an interest in new problems concerning statistical and fiscal material.

In Sweden the historian Lauritz Weibull, in conflict with many other Swedish Historians, started the critical history school around 1910 (see e. g. Odén, 1975; L. Weibull 1913, 1948-49). He used strict principles for source criticism that led to rejecting much old unreliable historical information. He was followed by his brother Curt and other historians and strict source criticism was after decades of disagreements accepted in historical research in Scandinavia at least (see e. g. methodological works by Dahl, 1967; Erslev, 1926; Nilsson, 1973; Renvall, 1965; Torstendahl, 1978). The main ingredient was doubt, which was in line with the methodological doubt that Descartes advocated (see e. g. Descartes, 1637, 1641). According to the Weibull School the historical conclusions should rest, not on subjective feelings, but on reliable facts. Every step in the thought process should be shown and be tested against the sources, i. e. detailed discussion of the sources must not be omitted. This line of thought can be compared with Bertrand Russells statement that it is unsuitable to believe in a statement, when there is no reason to presuppose that it is true (1950, p 1).

As suggested earlier within many other areas of the Swedish society we still seem to have

the low level of criticism of sources that existed in historical research a century ago. In some cases logic and reasoning is on the level of the witch processes of the 17th century in Sweden (see e. g. Ankarloo, 1971 about judicial evidence and reasoning).

Groups of quality criteria for information

Among Swedish historians four main criteria for source criticism are often mentioned. The first one is if there are signs of forgery. The second criterion is if the source was present, when the observations were made. The third criterion is biased information, e. g. biased selection, value judgments, partiality in reasoning. The fourth criterion is dependency between sources, which can be seen in similarities between texts.

I will here propose a different classification of a number of more specific criteria. Some of these are inspired by historical research, some come from my experience of examining investigations and being an expert witness in Swedish courts and some come from psychological and sociological methods and knowledge. The criteria are intended for both written and oral information and I will here use the word "text" also for oral information.

As the Scandinavian term "criticism of sources" can be somewhat misleading when the analysis is in fact focused on statements, I will here use the term "critical evaluation of information" (or statements).

1. The documentation criteria

The source should be documented carefully so the information can be checked. Information from anonymous sources is not reliable, but can be the object of further investigation. Sometimes the sources are confused. If an informant does not remember where the information came from, then the information is not reliable.

Documentation can be in several and different forms, for instance existing documents, video tapes or audio tapes, text written by an informant, text written by a receiver with or without corroboration of the informant. The receiver can also have passed the information on to another person who has written it down and there can sometimes be more than one person between the source and the text. This sequence can be called the 1st, 2nd, 3rd, etc. statement generation. For example, a letter can be the 1st statement generation. But if someone narrates what the receiver of the letter has said about its content we have the 3rd statement generation. It is well known from psychological research and experience that there occur transformation errors, transformation between statement generations. Therefore it is important to ascertain what statement generation is documented.

Another quality criterion is the specification of time (year, month, date, hour and length of occurrence) for the occurrence and the time specified when the information was written down. The place for the occurrence and for the reception of the information should also be specified.

Another important quality information is if and how information has been checked and if there is documentation of information from other sources that corroborate or contradict the information in question.

An essential piece of information is the identity of the author and if the document is initiated by someone else the identity of the initiator is an important information. The person or organization that has requested an official document should always be mentioned by the author.

When a transcript of an interview, conversation or interrogation is made it should always be signed by the person who has controlled that it has been correctly transcribed. Errors are common in unchecked transcripts. Translations should be checked and translations of important words can occasionally be disputed.

2. The basic content criteria

A few basic questions concerning content are the following:

What is the purpose of the text/message?

What are the methods used to generate information?

What information is in the text and what information is lacking?

What are the alleged basic facts? Are they reliable? Are they contradictory?

How does the source know what he/she claims to know?

What statements allegedly follow from the basic facts? Should these statements be challenged?

An investigative document should contain information about the purpose or the question at issue. It should also contain information about investigative methods, for instance why some informants were interviewed and others were not.

Other important criteria are how carefully or carelessly the document is written and how old or recent, and how vague or accurate the information is. Factual errors can often be difficult to ascertain but it is often clear that not enough factual grounds are shown in the text for a certain statement. Sometimes the alleged factual information is incompatible with information from other more reliable sources.

- Who made the observations and how and under what conditions were they made? Are descriptions of alleged situations/occurrences complete (who, what, where, when, how, how often, how long, what happened before and after)? Is the information vague or taken out of context?

- How complete is the document? Has some information been omitted or held back? How has the selection of information been made and is it biased? Are there statements of uncertainty or is certainty overstated? Are there expressions of unrealistic certainty? Are there indications of distortions, confusion and/or mistakes? Are there indications of exaggeration or playing down?

- What is the quality of the reasoning in the text? Are there explicit definitions and are they followed? Does the source make a distinction between facts and observations one hand and generalizations, interpretations, conclusions or judgments on the other? Is the evidence shown or is it hidden? Does the source contradict itself or other sources that are reliable? Are there incidences of bizarre reasoning or delusions? Does the content of the text change, for instance from factual content to speculative content? Are there indications of emotional,

moralistic etc contamination in factual matters? Is the sequence of thought from facts to conclusion shown? Do the conclusions follow logically from the basic information?

Often statements are made about individuals. Therefore another important critical question is if the individual has been given the opportunity to comment on the statements about him or his surroundings. The right to reply is fundamental in democracy and it is fundamental in evaluation of information. Often in investigations, adults or children possible to speak with, have either not been interviewed or have not been given the opportunity to reply to statements about them or their family. Rumours about individuals or groups is not acceptable information.

3. The questioning criteria

Much information is generated as answers to questions from researchers, investigators, interrogators, journalists, teachers, physicians, therapists and citizens in general. The situation, pressure, expectations, investigative strategies and specific techniques of questioning and giving cues can strongly influence the answers and in some cases lead to completely false answers and even to false confessions and false memories. It is well known that the investigator can give cues about what answers are wanted and it is also common that the same person can give different answers in different situations. Some investigators have strong expectations and press for certain kinds of answers. For instance in most of the Swedish police interrogations of children that I have studied the interrogators used a confirmation bias strategy, i. e. one-sided confirmation seeking of their conviction. Many investigators do not use alternative hypotheses in their questioning strategy. The occurrence of presupposing, leading, repeated, arguing and other inappropriate questions is often extensive in police interrogations and among journalists according to my experience. In many transcripts of interrogations it is evident that most of the information comes from the interrogator and the answers are often short and vague. In many accounts and summaries of conversations it is evident from the text that presupposing and leading questions have been used and it is also evident that the investigator is not aware that inappropriate questioning has been used. In most of the information from conversations, interrogations etc we do not have knowledge about either the exact questions, or the exact answers. The account often seems to contain interpretations of what was said. Informants often assert that they remember the exact utterances or at least remember the conversation well. The research existing on memory of conversations reveals that this is overconfidence. Free recall of conversations is subject to extensive forgetting and is not reliable. The information should be registered objectively or confirmed by the source.

4. The memory criteria

Knowledge of the memory process is important when evaluating information from human beings. Our memory is fallible in many respects and at the same time we often show overconfidence in our memories. Forgetting is to a large extent unavoidable and increases over time. Distance in time therefore is an important criterion when evaluating memories. It is also well known within memory research that memories from different occurrences can become confused. False memories can be generated and are a common phenomenon for all of us. There is hardly any scientific evidence that memories can be repressed as Freud claimed. Unusual or dramatic occurrences are better remembered than ordinary occurrences. Time specific of an occurrence can often be difficult to remember and occurrences can easily

be misplaced in time - sometimes closer to the present. Occurrences that have been repeated many times in the past, for instance doing something hundreds of times, can be remembered more easily. Experiences and present attitudes can influence the views and recall of occurrences in the past. Knowledge, experiences, needs and interests of the informant can lead to more complete memories, but can also bias memories. Cultural conceptions and myths can also contaminate memories - recall can be adapted to a cultural stereotype, e. g. "the good old times". A cultural or subcultural situation with discourse restrictions or discourse intensification can lead to de-emphasizing or intensification of certain kinds of memories. For instance, in the Swedish child protection investigations it is not customary to investigate the human resources of the family at the same time as the alleged faults are intensified, e. g. the organization demands a persuasive document in order to win the case in court. The retrieval situation can contain factors or activities that influence recall. An individual often presents his memories differently and even contradictory in different situations or contexts. Presented memories can also be the result of negotiations with others that were present, with friends, within families or groups. Memories can be collective constructions. Memories often seem to have a survival value for individuals or groups. They may be changed to strengthen their survival value, i. e. some, but definitely not all memory errors may have an adaptive value. For instance, to remember oneself as competent instead of remembering one's mistakes can have a psychological survival value. To remember faulty gossip and add errors to the already existing ones, can have a social value for the gossipier among friends and in gossiping groups. Others in other groups can survive by forgetting quickly and by not gossiping at all.

5. The source quality criteria

A basic question is if it is clear to the informant what kind of information is needed or wanted. It is important to ascertain the knowledge, competence and experience of the source/s/ within the area of concern. It is essential how much work the source has done for or how much contact etc a source has had with someone or something that the source is giving information about. It is also of importance how recent the general knowledge and the specific information is.

Another important question is how the informants have been chosen or self-selected. Is the selection of informants biased? Has information been gathered from all individuals or all groups involved? Who has dropped out or has been eliminated? Have critical informants dropped out for some reason or another? What is the personality and personality traits of the informants?

The mental states, motives, memory and metamemory (i.e. thinking about their own memories) processes and behaviors of informants should be taken into consideration when evaluating information. Does the informant show that he does not remember, evaluates his own recall negatively or show hesitation or uncertainty? What are the goals, motives, values, convictions and philosophy of life of each informant? Are there significant personality patterns, e. g. frequent lying or making up of stories?

What is the cognitive complexity of the informants? Do they have the necessary concepts and understanding? What capability do the informants have to be self-critical, i. e. to think about their own information? Is the information contaminated by the informant's own convictions or feelings? Does the informant mix up his own beliefs with what he is supplying

information about? Does the informant discount or avoid certain kinds of information? Is there an ambition to give socially desirable information only? Is the informant promoting himself? Does the informant have a strong persuasive capacity?

Is the informant leading the conversation away from answering a sensitive question? Is he/she unwilling to give certain information? Is the informant limiting or delaying information? Why? Is the informant giving and emphasizing irrelevant or trivial information? Why? Is the informant flattering the investigator? Is the informant appealing to feelings of sympathy of the investigator? Is the informant setting up the rules and manipulating the investigation? Does the informant seem to be afraid to give information or is it evident to him that reprisals can occur?

Sometimes when there are indications of a psychological disturbance of an important informant it may be necessary to get more information about the psychic status of the informant.

6. The source network and pressure criteria

Knowledge of the present and previous social networks of the source can be of importance when evaluating information. A network chart can be made. There may exist dependencies, pressure or force to give information, to lie or to withhold information. Information can also be unconsciously distorted. Is there pressure from friends, from the family, from the work place or from some important group? Does the informant look up to some authority? Does the information come from a social environment characterized by gossip and rumours? Is there risk for reprisals? Is there an implicit threat against the informant or against relatives or friends of the informant? Is there some sort of reward involved? Does the informant have secrets that he does not want revealed?

7. The receiver criteria

Sometimes the information has been written down or passed on by a receiver. It is evident that the characteristics of the receiver can bias the information. Several questions should be asked about the receiver. What is the knowledge and experience of the receiver within the area of the message? How well does the receiver understand the language or local expressions of the source? What is the social network of the receiver? Is there any pressure on the receiver? What are the preconceived notions of the receiver? What are the attitudes and values of the receiver? What are the expectations of the receiver? Preconceived notions etc can lead to unconscious perceptual and cognitive errors, for instance hearing something that is not said or not remembering certain information that is incompatible with preconceived notions.

8. The relationship criteria

Relationships often are of decisive importance when evaluating information. A central relationship is the relation between the source and the individual, group, object etc it gives information about. It is well known among investigators that information can be

contaminated by the existence of for instance friendship, sympathy, conflict, quarrel or competition. An illustrative example is the criticism parents in a custody dispute direct at each other. If there are different sources in a case their relationships to each other should be investigated. Are there dependencies? Sometimes sources that seem to be independent of each other in reality are dependent. For example, they may have common beliefs or they may be linked by a certain individual, interest or earlier occurrence.

Another important relationship is the relationship between the source and the receiver. If, for instance, the receiver dislikes the source, information can get lost or be distorted. If the receiver likes the source the information can be received uncritically or be exaggerated.

When the receiver forwards the information he has a relationship to the next receiver, for instance a group of supporters or a group of critics or a group of anonymous readers with largely unknown attitudes. The receiver may as a journalist/politician/gossiper try to make the information more sensational than it is because he judges that his readers/listeners want sensational information.

9. The power-interest-field criteria

Viewed from a sociological perspective society contains participants with interests and varying degree of power to assert their interests that may be for instance economical, political, humanitarian, ecological, religious and ideological in other ways. When evaluating information one has to take into consideration that it is generated in power-interest-fields. The participants can be public authorities, companies, non-profit organizations, media or influential individuals. The participants in the field can use their power to support, modify, fake, suppress or counteract information according to their interests and ethics.

An important criterion is how the participant has handled information previously, how honest or deceitful he/she is known to be. If an organization has strong interests to protect itself there may be reasons to doubt information stemming from it. Denying is a common countermeasure. When it is evident that a participant is looking for advantages or profit there can be grounds to reject the information from him/her. In many cases it is evident that a source is associated with a powerful establishment.

For instance, information from ordinary citizens, clients, patients and so on is often not considered important. Criticism may be censored. Many generated facts, research results, theories, evaluations, mass media reports etc are evidently constructed in favor of those in power. When evaluating information, ideologies of the sources and the investigators behind the generation of information should be clarified. Their ideologies can distort information, e. g. by supplying pseudo facts and through biased selection and biased interpretation.

Sometimes organizations can develop an organizational psychosis, i. e. they lose their touch with reality and they do not realize this. This can be connected with delusions of grandeur and paranoid tendencies. Without or with few factual grounds they assert that they know better than others or that they have the right opinion. They often view those who ask for factual grounds and open account as enemies.

Two strategies often used in the power-interest-fields are discourse restrictions and

discourse intensification. If it is in the interest of one or more actors they can reduce the discourse about X by generating implicit or explicit rules that reduce discourse. The rules can dictate who is allowed to speak about X and when and where it is allowed to speak about X. Rules also can prohibit speaking about X. Reprisals can be made against those who speak about X. A discourse can also be intensified by encouraging speaking about X and allowing the discourse about X at meetings, in mass media etc. Good examples are the Swedish child protection investigations where the faults of the parents are strongly emphasized and the qualifications of the parents are not given any attention or nearly no attention. The power-interest-field behind this unlawful phenomenon is that the social service authorities want to win their cases in the courts.

10. The analysis criteria

Sometimes information is presented only as observations or raw data. Sometimes it is presented as analyzed or as if it had been analyzed (but it is often not). Generalizations, interpretations, conclusions or judgments that would have required analytical work are often presented.

If basic data, methods and reasoning are not presented, are not precise enough or not available to inspection such statements should be rejected. Basic data should be both relevant and reliable and necessary data should be available. If these conditions are not fulfilled, analytical statements must be rejected. Contradictions or discrepancies in data have to be resolved.

Agreements between observations can give a more solid ground for analytical work, but sometimes agreements mean that the same bias or errors are recorded from different sources. Agreements between independent witnesses or independent investigators or different methods often give a stronger factual ground than agreements between dependent sources or agreement when the same method has been used.

Interpretations of data should be based on adequate interpretation work. All conceivable interpretations should be listed and after that they should be tried out on available data and other facts and allowance should be made for known base rates or probabilities. More data is often needed to decide about interpretations. Sometimes certain interpretations can be rejected, but there may be several possible interpretations left. Interpretations given by informants who have not conducted any analytical work cannot be accepted without adequate interpretation work.

The analytical competence demonstrated in the text is important when deciding to accept or reject information. For instance: Does the informant discriminate between data and interpretations? Does the informant systematically try out different possibilities? Does the informant use and understand thinking in terms of hypotheses? Are there logical fallacies in the informant's reasoning? How precise is his or her reasoning? Is the informant aware of sources of error? Does the informant reflect over method and logic of the analytical work?

11. The ethical criteria

Information that can damage individuals, families or groups should be handled carefully.

Sometimes ethical criteria for rejecting information can be used even if the information may be correct. For instance when detrimental information is irrelevant or if it is of questionable value or the only purpose is to damage it should be omitted. Innocent people should not be hurt. Individuals who have done something wrong should not be punished more than necessary. In Swedish child protection investigations it is common practice that social workers mention and often repeatedly mention large amounts of trivial, detrimental data about the parents. The factual ground is often lacking. At the same time favorable information about the parents is not mentioned. The intention is to construct a persuasive document in order to win the case for taking the child into custody.

Principles of handling the criteria

Critical evaluation of information according to the mentioned groups of criteria should be used to question, examine and accept or reject statements, but it does not guarantee that the remaining statements are true.

The following principles should be applied.

1. Not only raw data should be critically evaluated but also theories, methods, research results, reasoning, arguing and general statements.
2. Well-founded suspicions based on one or more criteria or other valid objections are enough to reject information. Often there are suspicions based on several criteria at the same time. In many cases it is sufficient with shortages or deficiency in only one criterion to reject a statement. For instance, statements without shown factual ground, without mentioned source or without acceptable documentation, should be rejected.
3. The examiner only shows the grounds for his suspicions and needs not prove that the statement is faulty, something that would be impossible for many statements. This principle is therefore practical. Furthermore, possible controls of statements is normally the duty of those who proclaim the statement.
4. The person or organization, whether source or conveyer of messages, that proclaims a statement has the burden of proof. Sometimes a conveyer asserts a statement, but the alleged source does not. When a statement is conveyed it should be clarified if and how the source has confirmed the statement.
5. Detrimental statements about identified or identifiable persons, families and groups of human beings should be examined and controlled extremely carefully.
6. The conveyer, user, decision-maker etc who has to critically evaluate a statement should weigh in the risk that he is willing to take that the statement is correct or faulty. The less risk one wants to take, the more the evaluation criteria should be taken into consideration. Risk- and consequence analysis should sometimes be conducted before a statement suspected of being wrong is accepted as true or rejected. Sometimes the consequences of rejecting a doubtful statement could be far more disastrous than the consequences of accepting it. The situation can also be reversed. There is at least one true Swedish story of a

resident reporting to an emergency phone number that his house is on fire. The receptionist did not believe him and the resident died in the burning house. And there are many stories about patients not having been believed by a doctor and dying shortly thereafter. Occasionally the consequences of rejecting a suspicious statement are so severe that you should accept it as true until proven otherwise.

Principles of responsibility

Taking responsibility means to actively do something to increase the quality of information/data and not only being a passive onlooker or uncritical conveyer. Every responsible professional and citizen should take his responsibility for critical evaluation of essential information. The main tool is to ask questions and question the data.

In order to accomplish a critical inquiry, competence is required in evaluation of the quality of information/data by professionals and laymen in general. This competence can be taught and trained in all educational levels from nursery school to university level. One important scientific base for such training is critical evaluation of statements according to criteria from historical research. Another important base is the psychological and sociological research, e. g. about perception, memory and social influences.

Every responsible professional and citizen should take responsibility for criticism of sources and for identifying unreliable sources and data. The main tool is to ask questions and question the data.

Some basic principles for critical information ethics can be the following and they are here formulated as urgent requirements:

1. You have responsibility for the critical evaluation of the information you pass on or use. Do not shy away from this responsibility by referring to your source or general knowledge.
2. Do not generate and spread unfounded information yourself, i. e. be self-critical.
3. Protect yourself from being hurt by faulty information by critical evaluation of statements, i. e. use protective ethics.
4. Do not use or convey unreliable information and especially not unreliable, detrimental information about human beings or groups of human beings.
5. If you for some reason convey questionable information it should always be supplied with source information and adequate markers of uncertainty and critical remarks.
6. You have the responsibility to trace and stop faulty or unreliable information that you have conveyed.
7. When you receive important information, i. e. to be used in important decisions, you should let the source check what you have written down from conversation or from tapes.
8. When you realize that a source is spreading unreliable or faulty information then you should stop what has been passed on.

9. It is important to publicly disclose sources that are presenting unreliable or faulty information. This may have a constructive effect on sources, conveyers of messages and receivers.

10. When you criticize sources and information you have to give explicit, precise arguments that others can examine and possibly refute, but it is not your responsibility to prove that the statements from the source are faulty. The burden of proof is on the source.

11. Information that is vague or ambiguous is not meaningful and often unethical. It should not be used. The source or the investigator has to generate precise and comprehensible information.

Conclusions and discussion

In summary two main conclusions can be made.

I. The competence to critically evaluate information can and should be developed among professionals and among citizens in general. Briefly this competence can be summarized in eleven groups of criteria and in a few general principles for rejecting information.

II. Taking responsibility for critical evaluation of information and use of critical competence should be encouraged and strengthened. Every individual or organization has responsibility for their generated or conveyed information.

If we put "garbage" information into reasoning and the decision process, then "garbage" will most likely come out. On the other hand, if we use reliable information the likelihood of better results will be much higher. The widespread assumption that information is reliable should, at least when the information could be of importance, be replaced by a principle of critical inquiry into specific statements and the circumstances around their emergence. Taking responsibility for critical evaluation of information should reduce the damages caused by faulty information and also give a more truthful view of the world.

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