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How much do we know today about accidents?

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It is well known that the society - in spite of many victims - underestimates accidents in comparison with, say, infectious illnesses. Reasons for such an attitude are in the false belief that we are able to avoid our accidents. Beside the fact that we are dealing with a very complex phenomenon, caused by many factors, some of which disturb (thwart) the reception of a clearer picture, there are many other reasons why the progress in accident investigation is relatively slow. Author classifies these reasons in 3 categories: administrative, methodological and social reasons. Different indexes in accident registration, confused reporting on accidents, definitions of some sorts of accidents are examples of administrative category; confusion in the meaning of the term "cause of accident", collecting all cases of injured people, regardless of the role they had in the accident, impossibility to assess the role of pure chance in different accidents, etc. are examples of methodological category; the social category consists of the relatively care-free attitude of the society toward accidents. In the nearly 80 years old history of accident investigation, practically all research in the initial and later periods were dedicated to the identification of personal factors, responsible for accidents. At first, practically all factors were included in the term "accident proneness", which became a "stumbling-block", and caused very hard disputes among psychologists. In spite of warnings of some authors, that "accident proneness" should not be understood as a "general" attribute, only recently the situation seems to be reconciled and resolved more successfully. Several "models" of accident causation had the useful role in this process (Oborne, Ramsey, Hale-Glendon). The models pointed successfully to the role of environmental factors in all accidents (in which human factor was included), and the authors of these models proved that at the beginning of investigation the role of environmental factors was unjustly neglected. More recent definitions of "accident proneness" make possible the more dynamic approach to this term, and enable - depending on the situation - to grasp the "proneness" in the whole diapason, i.e., from the "classical" *static*, to a completely *dynamic* and *situational* approach.

The Difference in the attitude

In highly developed countries accidents are the most frequent cause of death within populations aged up to 35 years. For the total population they are ranked on the third or fourth place.

During the World War II, the USA had 1.35 times more deaths and 53 times more wounded in accidents than in the war.

According to experts (Sande, 1994) the overall cost of accidents (personnel and property) is about two percent of gross national product.

In England about twice as many people die in accidents as from infectious diseases. However, "the fact that one or two hundred people have been involved in accidents, many of them fatal, seems to make little or no impression on the population" (Parry,1968, p.5). As a consequence of such an attitude much more money is spent on combating infectious diseases than on preventing of accidents.

Why such a difference in the attitude?

There might be several reasons for it.

(a) New investigations give more and more evidence that many people positively rank dangerous activities. Allen (quoted in Halle and al., 1987) reviews evidence from people's reactions to greater crises and suggests that there is a common element in all of them: danger is positively valued.

(b) Unsafe behaviour is frequently simpler and faster than the safe one, and negative consequences of unsafe behaviour (i.e. accidents) are rather scarce (Oborne, 1995).

(c) Hovden and Larson (in Singleton, 1994) claim that "unsatisfied basic needs for food, clean water and housing give context where questions of traditional accident

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risk...appear luxurious compared to more urgent problems of health and survival" (p.58).

(d) In some instances of unsafe behaviour (especially in traffic accidents) a very important element seems to be the feeling of personal control over a situation. Many modern authors holds this view (e.g. Halle and al., 1987, Jewell, 1990), and I wish to demonstrate it presenting my own research, carried out more than 20 years ago, giving thus a modest contribution to the topic.

Some time ago Suchman (1961) was engaged in studying striking differences in the public attitude towards infectious diseases and accidents. He gave the following example: if, for instance, ten people daily died from an infectious disease on American beaches, those beaches would be completely abandoned in a few days. But, when the same number of people die on these beaches every day in accidents, nothing happens.

Suchman explained this phenomenon by the fact that confronted with an infection people tend to panic, as the danger is not visible, and the only way out seems to be escaping from the infected area. On the contrary, accidents are considered - thinks Suchman - as fate, which cannot be avoided, and therefore nothing is undertaken.

It is, however, known from everyday life that many people who believe in fate often try to escape from it. Therefore, Suchman's interpretation did not seem plausible to me, and I administered a questionnaire to 441 subjects (90 of them were drivers aged in the average 45 years, and the rest of them students, with mean age of 20 years). (Petz, 1973). The subjects had to answer two questions: Would you stay, or would you leave when, upon arriving in a town, you learned that in this town some ten people die daily (a) in a traffic accident, or (b) due to an infectious disease? The subjects were asked to explain the answer, e. g. give the reason why they would or would not leave the town.

Results fully confirmed the well known fact that people are more inclined to run away from infections, than from accidents: 59 per cent of young subjects, and 83 per cent of older subjects claimed that they would escape in the case of infectious disease, and only 7 per cent of all subjects said that they would leave the town in the case of accidents.

But, what we were most eager to learn were the explanations of their answers. The explanation for the disease was expected: the danger was invisible, so the best solution was to escape. But for traffic accidents, the explanations were contrary to Suchman's assumptions: nearly all of our subjects who decided to stay in town, based their decisions on the conviction that they could avoid the accident if they were careful when crossing the street, or if they obeyed traffic rules, etc.

Several other investigations with similar results have since been published (Perusse, Wilson, Williams, Melinek, Ros, quoted in Halle and al., 1987).

Kay (1971) puts it in this way: "....we tend to think of accidents as happening to other people, not to ourselves".

In the field of traffic accidents this false subjective certainty seems to be most obvious: 75 - 90 per cent of drivers believe themselves to be better drivers than average ...."(Svenson, , quoted in Halle and al., 1987).

In the case of appearance of a dangerous infectious disease people clearly perceive the risk to which they are exposed , whereas in the case of accidents, the perception of risk is considerably lesser because of the confidence in our abilities to escape from the danger.

Some authors consider that there might be no connection between the perceived risk and the actual frequency of accidents. Jorgensen (quoted in Wagenaar, 1994) even thinks that the perception of risk and accident frequency might be in a negative correlation: "Perceived risk is likely to generate awareness of danger...whereas danger which is not perceived will tend to result in accident".

A subject of disputes

In the recent history of applied psychology accidents represent the subject of disputes, or even quarrels. It is therefore understandable that Lynette Shaw (1971) who is one of the leading experts in accident investigation, after presenting the disputes about accidents, says : "The very fact that scientists in other fields, who seem capable of pulling their resources instead of spending their time tearing other people's constructive ideas to pieces, have been able to land a man on the moon, makes the position with regard to accident research that much more depressing...".(p. 165).

Any psychologist, who was dealing with accidents, knows well that this topic belongs to a very complex research field, slow in progress. Some authors, even after 40 or more years of research are inclined to say that we do not know much more today than we used to many years ago, when in the twenties the investigation of accidents started.

In the most recent accident research new concepts have been included, which are very complex. One of them is the concept of "risk". According to Singleton and Hovden (1994) "risk" belongs to a group of concepts ("instinct", "set", "fatigue"), which once seemed substantial and important, but were abandoned, at least temporarily, because of their complexity.

Some reasons for the complexity of the problem

The main stumbling-block, which caused such a "hot" and long-lasting discussion was the term "accident proneness". However, first I shall try to analyze to some extent the reasons for the complexity of the concept of "accident". Some of them are the result of carelessness and misunderstanding, but some create really serious problems.

I classified these reasons in three categories: (A) administrative reasons, (B) methodological reasons, and (C) social reasons.

(A) Administrative reasons

1. Over a hundred years ago (1891) at a congress in Switzerland it was stressed that in registration of accidents standardized indices had to be used in order to compare results from different sources. But this had not come into practice until 1945, when the International Labour Organization adopted the first two indices: the frequency index (the number of accidents per million working hours), and the severity index (the number of days lost due to accidents, per thousand working hours). (Nowadays, in some countries even the second index is calculated per million hours).

2. Reports of accidents are incomplete and nonstandardized even among companies in the same country or in the same town. Many authors draw attention to this fact (e.g. Brody, 1963). It is not seldom that official annual reports about the same group of accidents differ, depending on the source of the data.

There is no agreement on how serious an accident must be to be classified as an accident. " The instance of a worker being cut on the hand by machinery, then returning to the job after a bandage is applied...may or may not be considered an accident... It is not clear if an office worker's paper cut constitutes an accident" (Smither, 1994, p. 450).

The forms for reporting accidents should include more information, if psychologists are to use them. For instance, there is usually no information about the type of accident: "One would expect to find different individual factors operating in accidents where people failed to detect the danger from accidents as opposed to those where they overestimated their control over a hazard of which they were perfectly well aware" (Smither, 1994, p. 318).

3. Definitions of different accident may differ. Extreme example of administrative nonsense was the definition of lethal accident in former Yugoslavia: an accident in which the worker was injured but died after entering the hospital was not registered as a lethal accident! Therefore Yugoslavia, which was at that time on the top of the European scale by the number of work accidents, was at the the bottom of the scale by the number of lethal accidents - of course this is practically impossible, as it is well known that a lethal accident occurs approximately in every 200 to 300 accidents.

(B) Methodological reasons

I will mention here only a few common or methodological errors, (some are made even today).

1. The cause of an accident may become a source of a great confusion. In some official reports under "Accident causes" we find expressions like "fall of worker", "boiler explosion", "crash of objects", etc., although they obviously refer to description and not to the cause of accident. Haddon (quoted in McCormick at al., 1982) says that "the cause of accident is frequently used as a synonym for the mechanics of injury (for instance "piercing instruments")".

At first I did not understand at all how could it happen, but today I suppose that the error has occurred in this way: in the past an century accident was not treated as a phenomenon; physicians who treated injured persons kept evidence of the number of injuries and their causes: it was useful to know how many workers were killed or injured due to a boiler explosion, or due to a fall, etc. Doctors could thus draw the attention of factory management to repeated injuries which were due to the use of a certain tool, or to poor work organization, etc.

When some 80 or 90 years ago first investigation of accident as a phenomenon was carried out, the past terminology pertaining to cause of injury was applied to accident causes as well - which was, of course, absurd. This might be the reason why many contemporary authors exempt injury as a "must" from the definition of "accident". Arbous and Kerrich (1953), for instance give the following definition: "In a chain of events, each of which is planned or controlled, there occurs an unplanned event, which, being the result of some non-adjustive act on the part of individual (variously caused), may or may not result in injury".

2. Psychologists and physicians investigating accidents should include in their sample all those who in the course of their work made a certain error, which - under different circumstances - could have lead to an accident. Since in a dangerous situation each n-th error (possibly each second or each thousandth error) can turn into an accident, recording of each error would multiply sample size for the investigation. Namely, accidents are the rare events, and it takes a great deal of time to obtain a more or less representative sample (people died in accidents cannot be included in the investigation).

Accidents are the consequences of unsafe behaviour. Today, many authors point to the methodological shortcoming of studying only accidents, i.e. consequences, in-

stead of causes. In order to obtain reliable data on individual characteristics, we should seek the data on the behaviour itself, rather than on its consequences. To my knowledge, Hakkinen was the first author to suggest this procedure.

However, there are find two obstacles related to this matter:

(a) Some authors argue against registration of errors. Haight, for instance, (quoted in Shaw, 1971) ironically mocked the idea of using errors instead of accidents, as a criterion for accidents. But, in my opinion Haight's criticism is a complete failure, because each accident (in which man was involved) occurred because man reacted inappropriately to the certain situation in a certain moment; in other words, he made an error. (It is irrelevant here whet-her the erroneous reaction was due to ignorance, or carelessness, or superficiality, incapability or any of other reasons, systematized so effectively by Reason and others).

(b) But the main problem here is how to record all errors in man's work. If an accident occurred, then we know that the error preceded (and the sort of error, if necessary, could be also found). But if the error did not result in accident, then it is possibly known only to the person who made it, and for other people it is usually "invisible", or only partly noticeable. The term "near accident" (or "near miss") has been introduced just to refer to the kind of error, that might have led to an accident but did not. Unfortunately, only in some jobs (e.g. engine drivers) this sort of errors can sometimes be recorded.

Today, some authors are aware of this methodological obstacle in the research on accidents. It is therefore not surprising that some of them focused their attention on this serious problem. Among them, Sheehy and Chapman (1986) have published a very serious discussion about the methods which one could use to register the errors. These are some verbal and non-verbal techniques.

It can be mentioned that Withlock (quoted in McCormick at al., 1982) as early as in 1963, arranged for supervisors to record employee's "unsafe behaviour" using the critical incidence technique. The obtained scores were correlated with injuries in a later period, and the results were quite satisfactory.

3. Due to the fact that only accidents - i.e. something that has already happened - are used as a criterion, as some authors (Wagenaar, 1994) warn, accidents are investigated "retrospectively", that is, the situations in which accidents really occur are represented by the subset of those situations in which accidents did actually occur. "There is no control group of situations in which no accidents occurred. This is unfortunate, because it is quite possible that there is a fundamental difference between those dangerous situations that developed into an accident and those that did not" (p. 271).

4. In accident investigation, the injured person is typically taken into account. But, the injured person is not necessarily the one who caused the accident: if a worker wants to show what a skillful acrobat he is by throwing a hammer in the air, and the hammer slips and hits another worker at his head, then this other worker is usually taken as a subject in the sample of injured people, although he had nothing to do with the accident!

(C) Social reasons

Social reasons have already been discussed within the introduction. Society is much more impressed by victims of some infectious disease than by victims of accident, especially traffic accident. Some thirty years ago the president of the British Psychological Society (G.C.Drew) pointed out: "The discrepancy between the research money invested, the prestige attaching to research workers, public alarm at any temporary failure in control of poliomyelitis, for example, and of accidents, is a problem worthy of attention in itself" (quoted in Eysenck, 1965). An example: in 1958 19 000 people died in Great Britain as a result of accidents, and in England and Wales 129 died from poliomyelitis.

As it is well known, the investigation of accident phenomenon began in 1919, when Greenwood and Woods published the results of comparison between the distribution of accidents in a group of workers, and the distribution that should be expected under the hypothesis that accidents are due to pure chance (Poisson distribution). It is also known, that these two distributions usually differ: there is significantly larger number of people with zero or a very small number of accidents than one would expect according to chance; and also, there are more people with a higher number of accidents, than expected by pure chance. In other words, the accident distribution is a "negative binomial distribution", and not a Poisson distribution. Because of a logical difference between these two distributions (which will not be discussed here) the authors came to the idea that there must be something in people themselves that produced this difference. In 1920, Greenwood and Yule confirmed the results of Greenwood and Woods, and Newbold also found the same phenomenon in 1926. Consequently, Farmer and Chambers in 1926 suggested the term "accident proneness", meaning some personal trait or traits which predisposed some to have more accidents than others at work.

It is interesting to note that in some textbooks or other publications we can still find an argument , that allegedly proves the existence of accident proneness. The argument is: practically always a small number of people is responsible for the largest number of accidents. But this argument does not prove anything, because even if accidents were due to a pure chance, a small number of people

would have the largest number of accidents: in Monte Carlo a small number of gamblers gets most money! The argument should look like this: there are considerably more people without accidents and considerably more of those with a large number of accidents than we could expect according to pure chance.

Greenwood and Yule suggested that accident proneness was a proved fact, not a theory any more.

According to Arbous and Kerrich (1953), it was an unfortunate fact that it was assumed in almost all the literature that the existence of accident proneness was an established fact, and that it was a stable phenomenon in an individual make-up.

The authors who revealed that the distribution of accidents deviated from chance distribution pointed out that a negative binomial distribution did not prove the existence of accident proneness. Statistical analysis of accidents is only the analysis of what happened, but not of why it happened. A negative binomial distribution shows just that the investigated group is not homogenous. But the reasons for being non-homogeneous may not be only because people within the group are different, but also because the exposure of those people in the group was different. (To be honest, the research on accidents by our psychology students, has never demonstrated a difference in exposure between people with few accidents and those with too many).

Investigators, who were not very skillful at statistical reasoning at that time, failed to notice the warning, and most of the confusion that has occurred since 1926, has resulted from an overstatement of these authors' claims, and disregard of their warnings. The general "belief" of most of the authors was that accident proneness was a fairly stable attribute.

In my opinion, there is another reason that may also have contributed to this belief. This reason concerns only the non-English speaking countries and is related to the translation of the term "accident proneness". The term is, in fact difficult to translate, because it is apparently so vague and indeterminate that each researcher feels free to interpret it in his own way (Shaw, 1971). The Croatian translation means, in fact, "inclination" to accident. Probably the most unfortunate translation was German "Unfalldisposition", which semantically suggests a biological basis.

Simultaneously, another term emerged in the literature. This is the term "accident liability". I believe that Farmer and Chambers were right when they distinguished those terms: "The fact that one of the factors connected with accident liability has been found to be a peculiarity of the individual allows us to differentiate between "accident proneness" and "accident liability". "Accident proneness" is narrower than "accident liability", and means a personal idiosyncrasy predisposing the individual who possesses it in a marked degree to a relatively high accident rate. "Accident liability" includes all the factors determining accident rate: "accident proneness" refers only to those that are personal" (Arbous and Kerrich,1953).

Disappointments that followed as a result of belief in existence of "something", called "accident proneness" encouraged many present-day authors to reject the term "accident proneness" (e. g. Corsini, 1994, Kerr, 1957, Smith and Beringer, 1987), although perhaps prematurely (Hale and Glendon, 1987).

The modern approach to the accident proneness stresses the influence of environmental factors, and is nearer to the term "accident liability", than it used to be.

In the heat of the most vehement discussion about the concept "accident proneness" when - as mentioned earlier - Haight and other "specifists" attacked "generalists", who believed in accident proneness, the most moderate was Eysenck, who warned as early as in 1965, that there were two different views regarding the concept of "proneness". "We may mean by accident proneness - and undoubtedly some people do use the term in this sense - that some people are innately predisposed to suffer accidents under almost any conditions and in relation to almost any type of task. Taken in this way, I think the term must almost certainly be rejected.....We come, therefore, to e second conception.....which is rather more restricted. It says, simply, that for any given activity there are certain abilities, personality patterns and traits, interests, attitudes, and so forth, which are necessary for the safe performance of that task, and that, when these are missing to a greater or lesser extent in that person, than that person is more or less likely to suffer accidents in the pursuit of that activity" (1965, p. 239 - 240). Later, (Foreword, Shaw, 1971) Eysenck claimed that much of the controversy about the existence of accident proneness has been purely semantic. "Accident proneness can be defined in many different ways, and to deny its existence at one level does not necessarily contradict someone else's affirmation at another level" (p. IX-X).

There are several reasons why the concept of accident proneness should not be understood as a "general" characteristic, i. e. the characteristic which holds for all accidents of a person, and especially not as a characteristic which is the same for all accident prone people.

Here are the arguments:

1. People differ, and one can normally expect that - even if a characteristic responsible for making a person accident prone existed - it would not be the same characteristic in all people.

2. An individual's behaviour is variable, and his relation to a dangerous situation depends to a great extent on his condition, his readiness to record the dangerous situation, and to react to it at the given moment.

3. As I pointed earlier, each accident caused by man is a consequence of a certain error . We can say that an accident is a "penalized error" (Petz, 1987), or "an error with sad consequences" (Cherns, quoted in Kay, 1971). A "near-accident" is also a consequence of an error, but without punishment. As errors can be classified into several types - as shown by Reason and other authors - they could consequently cause several types of accidents. An accident caused by a driver who overtook a line of vehicles and experienced a collision cannot be considered comparable to that of a driver whose car slid off from a slippery pavement at a curve. The two accidents are essentially different from another one, which occurred to an unskilled driver who missed when changing the clutch, or who switched off the lights by mistake, etc.

If accident proneness existed as a "general" characteristic, it should have been proved (a) in all accidents of different people, or at least (b) in all accidents of the same person.

If (a) were true, then a successful selection of "accident safe" people would be possible. And if (b) were true, a high correlation should always be found between accidents in two different time periods for the same person.

Ad (a) As we know, the most of investigations have been directed towards search for a test (or tests) suitable for successful prognosis. In this field, however, greatest disappointments have been experienced: accidents are in low or very low correlation with a large number of tests used. In other words, the occurrence of accidents is influenced by a very large number of different subjective factors, depending on the actual objective environmental circumstances.

Ad (b) Correlations between two time periods are confusing. The majority of authors have found very low correlations or no correlation at all between time periods, but some have reported higher correlations (up to 0.6 or even higher). The old results of the forgotten investigator Marbe (1926) showed an obvious connection between the number of accidents in two time periods: the people with the minimum number of accidents in the first period were those with the minimum number in the second period, and the same was true for the people with the highest number of accidents. Laugier in France (quoted in Petz, 1987 reached to the same conclusion, and Whitlock, (quoted in McCormick and al., 1982), who has already been mentioned, obtained a correlation between 0.35 and 0.56.

Thus, what should we think about accident proneness?

Justified criticism of this term today warns that it neglects to a great extent the environmental role in the occurrence of accidents. Indeed, some authors understood accident proneness only as a more or less general personal characteristic. But as already pointed out, this cannot be a general characteristic since obviously different accidents occur due to different reasons.

But isn't there really even a single factor, that could be considered more or less general?

A quarter of a century ago Hakkinen (1971) commented on this question most successfully: "I cannot fully understand any discussion on topic "Does accident proneness exist or not?" What happens if we allow a group of blind or feeble-minded persons to drive a car...."And later: "The statement "No accident proneness exists" is a typical school statement. Earlier, it was usual in psychology to have such a rigid reaction to questions not fully understood. Nowadays, it seems unwise and unrealistic" (p. 218).

We are sure today that under the concept of accident proneness only exceptionally we could speak of a "general" characteristic, as well as that in searching for accident causes not only human characteristics should be thought of, but the surrounding situation as well. This has been stressed by many contemporary authors. Thus e.g. Brody (1963) says: "Essentially, the overall problem of accidents appears to be a matter of functional disharmony or imbalance between man and environment...". Or, we could quote Oborne (1995), who says that accidents are unfortunate, unpredictable, unavoidable and unintentional interactions with the environment.

Over 30 years ago Eysenck (1965) said: "....for any given activity there are certain abilities, personality patterns and traits, interests, attitudes, and so forth, which are necessary for the safe performance of that task, and .... when these are missing to a greater or lesser extent in that person, then that person is more or less likely to suffer accidents in the pursuit of that activity" (p. 240).

I have tried to define the concept of accident proneness in this way : "Accident proneness is a concept of necessity, which means... lack of abilities and characteristics which are in a given moment important for safety, or possession of characteristics which are in a given moment undesirable for safe work (Petz, 1975, p. 147).

This definition points explicitly to the situational approach , i.e. that it is not a question of the same characteristics. But in my opinion some personal characteristics could be a factor of accident proneness in practically all situations (e.g. blindness, severe intellectual deficiency).

All in all, the most realistic approach to the problem of accident proneness was, in my opinion, offered by Lynette Shaw (1971), who suggests that factors defining proneness, could be sorted into three categories:

(a) those that remain virtually unaltered over a long period of time (e.g. sex)

(b) those that change slowly with time (e.g. age, experience, some personality traits)

(c) those that are purely temporary. (There are many of those, and among them let us mention diseases, influence of alcohol, stress, worries etc.).

Porter and Corlet (quoted in Oborne, 1995) gave the following picture: accident proneness can be represented by a continuum with the non-accident prone people at one end, and accident prone people at the other.

This wide range of situations, from minimum or no inclination, to maximum inclination, is successfully presented in recent models of accident occurrence. There are many such models, and the principal characteristic of all of them is that in addition to the person and his/her characteristics, they take into account the environment as well, and show an interaction between these two factors.

I will mention here only two models, i.e. Oborne's model, which does not necessarily include the concept of accident proneness, and a model developed by Ramsey and co-workers.

Oborne's model (see Figure 1) shows clearly that "essentially, the overall problem of accidents appears to be a matter of functional disharmony or imbalance between man and environment" (5), while Ramsey's model (see Figure 2) systematically shows in which areas a "shortcut" between man and situation could occur: in the field of sensory perception, or information processing, or attitude, or in the field of anthropometrical characteristics.

Both models (and of course other modern models like Hale-Glendon's model, Surry's, etc.) take into account *chance* and its role in accidents. Ramsey's model reasonably presumes that chance may also prevent an accident despite conditions for accident taking place, but also that a chance may create an accident even if there are no objective reasons for it.

Finally, I would like to say that in my opinion Oborne's model can be applied in the presence of a strong accident proneness factor as well: that factor will more or less regularly *decrease* the level of the upper curve, showing the operator' s possibilities (see Figure 3.), and therefore will increase the chance of accident.

The aim of this paper was twofold:

1. I tried to list main factors which slow down the progress in accident investigation, and

2. I suggested a definition of accident proneness, which might be useful for further investigation, and which might stop the everlasting discussion about accident proneness.

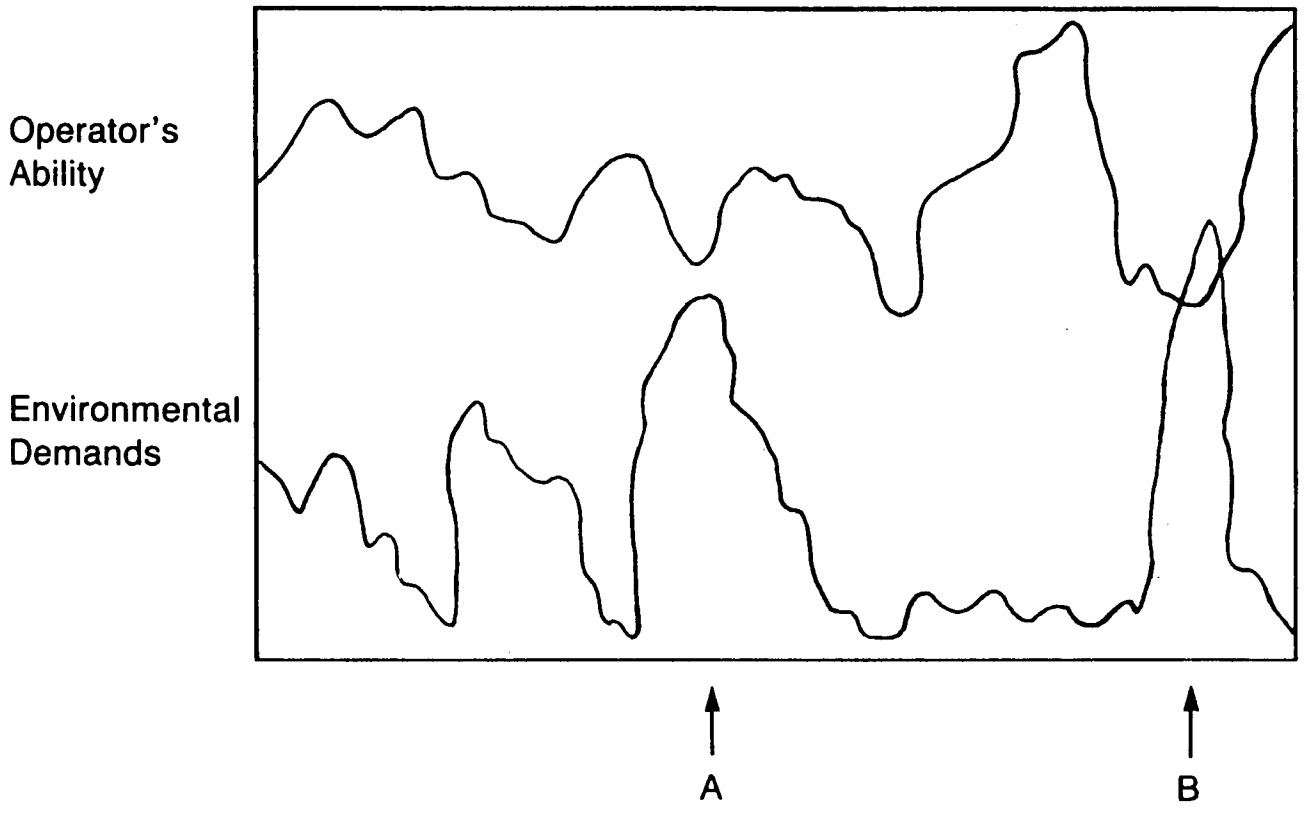

Figure 1. Oborne's model of accident causation.

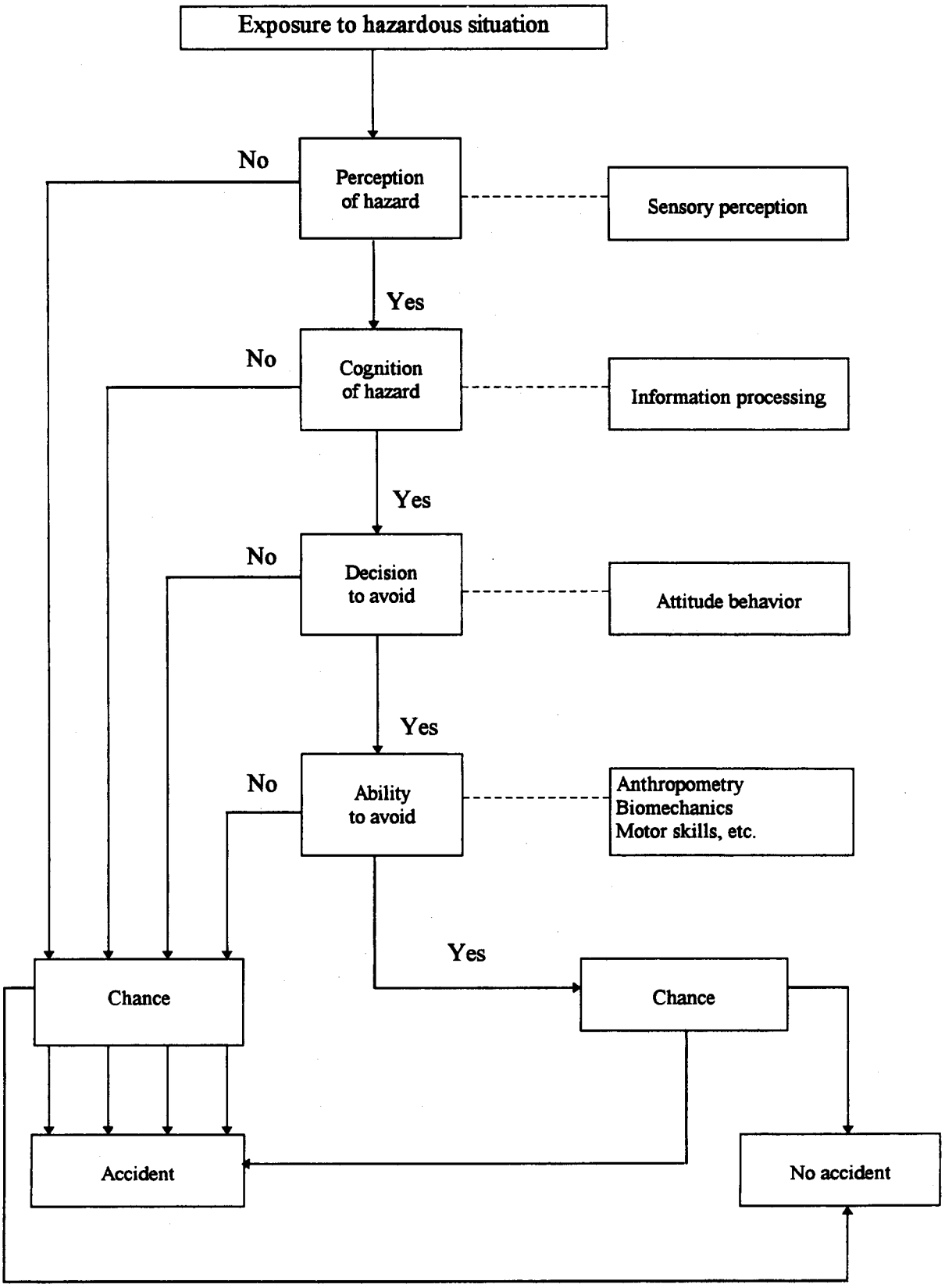

Figure 2. Sequential model of accident occurrence, by Ramsey and co-workers.

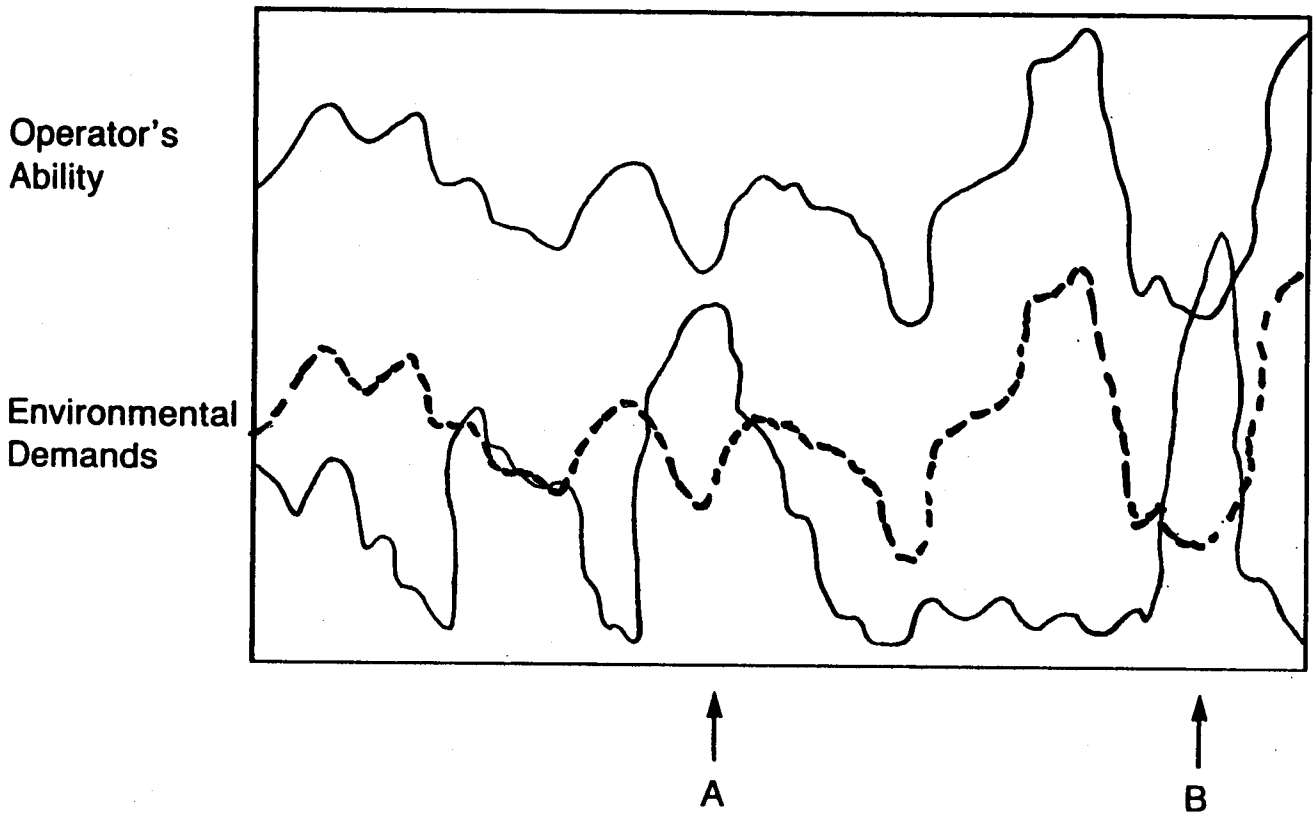

Figure 3. Oborne's model does not exclude the existence of "accident proneness"

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