

Toward a public health of situations: the re-contextualization of risk

Por uma saúde pública de situações:
a recontextualização do risco

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Abstract *This paper reviews the role of situational variables in health risk behaviors and the literature on the impact of context and situation in public health. Three postulates for a situational model are presented: that the situation can account for additional variance in explanation of health risk behaviors; that the power of the situation is reciprocal to the degree of individual autonomy; and that the situation is definable and measurable. A situational presentation methodology is presented for measuring situations in public health with preliminary data on its efficacy in the context of sexual behavior and injecting drug use as HIV transmission risks. Interventions which maximize the use of situationally-based information are discussed. It is concluded that situational presentations may offer additional explanatory power in public health and a means for intervening at a situational level.*

Key words *Risk Assessment; Risk Behavior; Sexually Transmitted Diseases; Public Health*

Resumo *Os autores fazem uma revisão do papel das variáveis situacionais nos comportamentos de risco para a saúde, assim como, da literatura sobre os impactos do contexto e da situação na saúde pública. São apresentados três postulados para um modelo situacional: que a situação possa explicar a variância adicional nos comportamentos de risco; que o poder da situação seja recíproca em relação ao grau de autonomia individual e que a situação possa ser definida e mensurada. Uma metodologia situacional é apresentada para medir as situações na saúde pública a partir de dados preliminares sobre sua eficácia no contexto do comportamento sexual e uso de drogas injetáveis como fatores de risco para a transmissão do HIV. São discutidas intervenções que maximizam o uso da informação com base situacional. Conclui-se que as apresentações situacionais podem oferecer poder explanatório adicional na saúde pública, assim como, servir como meio para intervir ao nível situacional.*

Palavras-chave *Avaliação de Risco; Comportamento de Risco; Doenças Sexualmente Transmissíveis; Saúde Pública*

The situation is a crucial element in public health: Triandis (1994:26) has described it as “one of the most powerful predictors of behavior”. Traditional public health models of infectious disease emphasize the interactive contribution by examining the triad of the organism, the host, and the environment, but in health promotion and health education research, the environmental aspects are often considered insofar as they enable, reinforce, or predispose to healthy or risky behaviors in the individual (Green et al., 1980) but with little attention to an immediate risk situation. Health risk taking, whether it be sexual interaction, smoking, eating, sunbathing, or drug use, is a behavior or sequence of behaviors which occurs in a temporally and geographically (and often socially) bound environment. However, the bulk of research into health risk behaviors has focused on personality and attitudinal characteristics of the individual, with minimal attention to the situation in which the risk is located. This focus on the individual not only imputes control of health behavior to the individual, but also devalues the impact of the immediate social and situational context in control of behavior. Health behavior, we argue, is shaped to a significant extent by these social and situational variables – for example where the same individual may take very different risks in different situations. Given that our task is to account for as much of the variance in a health risk behavior as possible (in much the same way as astronomers seek to account for the hidden dark matter in the universe), the situation may provide us with a significant amount of previously unexplained variance. An understanding of the sources of this additional variance should assist public health professionals in identifying not only situational variables which are potentially modifiable, but also call attention to the interactions between person and situation. A situational model of health behavior is premised on the idea that people are affected by the settings in which they act. In this paper, we review the literature on the psychology of the situation, make some predictions regarding the influence of the situation on risk behavior, describe a system of measurement of situations, and present some empirical data derived from this system. Finally, we discuss ways this situational presentation tool may be used in public health research. The resulting situational model attempts to bring together theoretical and empirical approaches for explaining the power of the context in health behavior.

Situation and environment

Recognition of the importance of the situation as a determinant of behavior is not new. Burke (1962, 1965) noted that situations (including physical apparatus) themselves may symbolize and motivate the action which takes place within or around them, and that actions derive their character from the entire framework by which we judge them. He argued that the term “motive” was a linguistic concept by which an observer explains and understands situations, and that the scene is one of the five key components to be addressed in response to the question as to what is happening. Cottrell (1948) also suggested systematic research on situations as a basis for understanding actual behavior, and Price (1981) noted that situational theory allows researchers to diagnose high risk situations and on investigation and analysis, design interventions. In 1986, Bandura suggested that social cognitive theory favored a conception of interaction based on triadic reciprocity – where behavior, cognitive and other personal factors, and environmental influences operate interactively as determinants of each other. He noted that the relative influence of these three sets of factors will vary for different sets of activities, individuals, and circumstances (Bandura, 1986).

Endler (1981) makes the distinction between environment and situation, where the environment is the general and persistent background within which behavior occurs (also referred to as macro-environment or context), and the situation is the momentary or transient background (also referred to as micro-environment). Here, we define the situation as bounded temporally, physically, socially, and in terms of goals – essentially, as a micro-situation. For example, a room in which several people are injecting drugs with the goal of getting intoxicated within a half to one hour period is a situation – bounded physically by the stage, actors, time of performance, and goal, to use the terminology of Goffman (1969). Goffman (1969:32) describes setting as including “*furniture, décor, physical layout, and other background items which supply the scenery and stage props...*”. Zinberg (1984) has described the interaction of the drug ingested, the set of the actor, and the setting within which the drug is used, in producing widely varying reactions to the same drug in different situations. Zinberg conceptualizes setting as varying on a continuum from national to the immediate context of room and those within it, and his model of drug, set, and setting may also be

seen as a behavioral equivalent to the public health triad of organism, host, and environment. While not arguing that larger settings and contexts are not important, in terms of measurement, this paper will restrict its discussion to the micro-situation in which risk behavior may occur. However, as Endler indicates, the borderline is not precise.

Endler (1981) also notes that compared with the person, the situation has received comparatively little attention in psychological research. The emphasis on personality was derived from psychometrics, Endler suggests, and from the prevailing social system of 19th-century liberalism which held that individuals and not prevailing social conditions shaped their own lives. This sociopolitical emphasis is still apparent in modern North American public health, where interventions and explanations tend to focus on the individual's attitudes and beliefs, although this has also been criticized as "victim-blaming" (locating the cause of the problem in the people who are enmeshed in the problem - Ryan, 1971). An emphasis on situational factors may have a corresponding sociopolitical advantage of de-emphasizing "victim-blaming" and focusing attention on the role of environmental factors in risk behavior. In the public health context, Stokols (1992:6) also notes that, "*The majority of health promotion programs implemented in corporate and community settings have been focused on individuals rather than environments. That is, they have been designed to modify individuals' health habits and life styles (e.g., exercise and dietary regimens) rather than to provide environmental resources and interventions that promote enhanced well-being among occupants of an area...*".

The social ecology of health promotion (Stokols, 1992) has been extensively discussed, focusing on the environmental qualities of organizational and community settings which are health promotive. However, Stokols emphasizes the broader macro-situation, including both social environment (culture, economics, politics) and physical environment (geography, architecture, and technology). Participants in these environments, he suggests, can be studied at varying levels of scale and complexity, with local settings being nested in more complex and remote settings. The social ecological approach to health promotion, Lindheim and Syme (1983) argue, requires explicit analysis of the interplay between the environmental resources available in an area and the health habits and life styles of the occupants of the area. Using Stokols' characterization of en-

vironmental scale, situations are individual or group activities occurring at a particular time or place. Here we focus on the lower end of scale and complexity, on the *risk situation*, rather on the features of the physical, social, and cultural environment that influence the etiology of health and illness and which are the point of convergence of much of the social ecology of health promotion. The concept of *risk situation* (initially used by Kelly et al., 1991, to describe the relationship status and HIV serostatus of partners in unsafe sexual episodes) involves a re-contextualization of risk behavior.

Risk situations

The *risk situation* is a construct which describes the situation in which risk behavior occurs, and which may either initiate or promote risk behavior. For example, a risk situation may include drug use, peer pressure, unfamiliar environment, lack of condoms, money, and loneliness or arousal, all of which may make unsafe sexual behavior with an unknown partner more likely. Gold (1993) calls these "*types of occasion*" - referring to factors in the life of an individual which can vary over a relatively short period of time. Some of the lack of understanding of risk behavior may be related to the fact that it is unsituated in terms of time, place, and affect. For this reason, a critical incident approach, which asks about the last time a risk behavior occurred, and its time, place, and other accompaniments, may provide useful clues as to the influence of the situation (Ross et al., 1993).

Gold (1993) has argued that the gap between individually-focused theories of health behavior and occurrence of health behavior is the gap between intention and what happens when the time comes to carry out that behavior. He argues that a significant component of this gap can be explained by the difference between "on-line" and "off-line" cognitions (which we refer to here as "hot" and "cold" cognitions). "Hot" cognitions are *situated* cognitions - for example, those that are present when people are in a sexual situation - and differ from their "cold" cognitions when they are out of that situation, and where the perceptual cues such as mood, partner's good looks, sexual arousal, and so on, are not present. Gold notes that the lack of self-justifications, perceptible cues, "bargaining", desire for excitement, mood, substance use, and partner type account for some of the differences between "hot" and "cold" cognition (Gold & Skinner, 1992; Gold,

1993; Gold et al., 1994). A situational model of health behavior seeks to situate those cognitions in a context which allows for some generation and measurement of the heat as well as the cognitions by situating the cognitions in as realistic a context as possible: "in the heat of the moment".

Individualistic versus community approaches

North American and European psychology has tended to concentrate on the individual as unsituated: Martín-Baró (1994) argues that individuals are presented as bereft of their community, political history, social structures, and a dialectic of interpersonal relations. He suggests that a focus on the social as well as the personal root of problems and analysis of behavior in the light of social as well as personal meanings should occur, and argues that the need to understand the context of the individual goes beyond the psychological context to the physical and historical, insofar as these can be separated. Marcus & Kitayama (1991), in a comprehensive review of cultural conceptions of the self and others, present substantial evidence that the North American and Western European independent view of the self contrasts markedly with the interdependent view in most other parts of the world. They note that the Western notion of the self as an entity detached from context is simply not an adequate description of selfhood: in non-Western cultures, self is viewed as interdependent with the surrounding context. Stokols (1992) also notes that the majority of health promotion programs in North America have been focused on individuals rather than environments and have been designed to modify individuals' health habits and life styles. Indeed, Kakar (1990) argues that in the Indian context, behavior cannot be easily comprehended outside of the situation, and that the telling of a story to explain an action is to locate any explanation within a specific context – and a reason why abstractions of behavioral motives in individual contexts are not easily understood. This abstraction of motives, stripped of context and surrounding discourse, may be one of the reasons that health promotion interventions based on individualistic concepts of behavior change are seen as alien in non-North American settings. Research which investigates the discourses surrounding health risk situations is one way of understanding the models of behavior change which interact in a particular setting.

We argue that the concept of the situation is more useful in approaches in which the community rather than the individual is emphasized. The power of the context is probably inversely correlated with the degree of individual self-efficacy, where the more self-efficacious the person, the less the context will determine behavior. In a setting where the community is emphasized more than the individual, self-efficacy will similarly be attenuated, particularly when others are present in the situation, over and above the influence of peer norms. There is also a potential reciprocity between person and environment: Freire (1971) notes that his concept of *conscientização* (critical consciousness) leads not only to personal and social transformation, but that persons change their relations with the surrounding environment (including other people) (Martín-Baró, 1994). This interrelationship with environment illustrates the possible continuum between individualistic and community-based approaches where the community may form part of the context and situation. Where the agency of the individual is strengthened, the impact of the context, including community, is likely to be lessened (or modified) (Bandura, 1986). It follows that situational analyses are likely to be more useful to explain a greater amount of variance in health behaviors where there is less focus on the individual as an independent agent. Such hypotheses regarding the relationships between situational variables, self-efficacy, and external locus of control are empirically testable.

Psychological research on the situation

There is a substantial literature on the psychology of the situation. Magnusson (1981a) suggests that the situation can be seen on a continuum, ranging from the macro-situational, where the larger environment is the focus, to the micro-situational, for example a specific situation located closely in time and space as well as social context. Magnusson further suggests that the temporal and psychological proximity of the individual to the situation is an important continuum which will determine the individual's reaction to the situation. In the sense that previous experience will determine reaction to the situation, he notes that "*past environments are also present*" (Magnusson, 1981a:3). Magnusson (1981b) makes a crucial distinction between the *actual* environment (the physical and geographical environment, and the biological environment, including the

physical characteristics of the persons present) and the *perceived* environment (which will include the application of the sociocultural rules for prescribed behavior in that setting). Situations, he notes, form our perceptions and norms, and give feedback. In this last sense, the situation provides what Rotter (1955) has called "*reinforcement value*" and what Skinner (1938) refers to as "*respondents*" (direct responses to stimuli), although what Skinner refers to as "*operants*" (reactions independent of observable stimuli) may in fact be shaped by the situation as well. It is a central argument of this paper that behavior takes place in, and exists in relation to, situations, and that the situation and its associated reinforcers will account for a significant amount of the variance of the behavior occurring in it. Magnusson (1981b) suggests that incorporating the situation in the equation makes for more realistic and functional models for cognitive behavior – and specifically, that considering the person and the situation and their interaction will lead to a better understanding of behavior. Trait models of behavior, focused on the individual, examine stable cross-situational models, while social models, which focus on the social determinants of behavior, examine the effects of different social situations over the same individual. There is ample evidence for the changing of behavior by changing the environment in which it occurs (e.g., Sherif et al., 1961). Magnusson compares the individual and the situation distinction to figure ground relationships in perceptual psychology, where the interaction is a critical component: the perception can only be understood in terms of both components.

The situation, suggests Magnusson (1981b), can be defined in terms of the *stimuli* (what is there) and the *events* (what happens there). Situations can further be defined in terms of generality (what happens in a classroom) versus specificity (what happens in this specific classroom at this particular time). To understand the power of the situation, Magnusson argues, what is important is what is central to the actor, and that what is peripheral is irrelevant. The perceived context, then, may be different in content and in emphasis from the actual environment when viewed through the filter of the actor. There is also the dynamic component, where the reciprocal interactions between actors and situations will impact both person and situation. The characteristics of situations can, suggests Magnusson (1981b), be defined in terms of some nine dimensions. These may be grouped into the broad categories of structure, content, and setting. The

structural characteristics include the complexity of the situation, its clarity (what variables are overt or covert), the strength of these variables, and the degree of promotion versus restriction (for example, the range of behaviors permitted, such as in a prison or hospital, compared with a less restrictive setting). The content characteristics include sociocultural variables such as the tasks, problems, demands, and goals in the immediate situation; the rules and/or rituals associated with the situation; and the roles which are ascribed or adopted by the actors in the setting. Finally, there are the setting characteristics, which will include the physical setting and the other persons (if any) present.

However, as Endler & Magnusson (1976) and Magnusson (1981b) also note, the perceived environment is important (a point which will be returned to in the discussion on elicitation of situational variables). Since the individual is active in perceiving and attending, what is selected, construed, and evaluated is critical to the measurement of situational correlates of behavior. The perception of situation will depend on the structure and content as well as the individual variables such as the affective tone in the situation, the coping strategies of the individual, and the skills of the individual. There will be both common and unique situation perception, corresponding to the shared social and cultural understandings as compared with the private world of the individual. Situation perception, however, is a personal characteristic as much as it is a setting characteristic: Magnusson & Stattin (1978) report that differences in perception will differ in regard to important characteristics such as age, gender, and culture. In a study examining anxiety reactions to three different situations (for example, in the woods at night, alone at home, alone in the woods at night), they found that the level of anxiety reaction demonstrated striking cross-cultural differences for these specific situations.

The taxonomy of situations is important to determine what variables may be of importance in assessing situational behaviors. Argyle (1981) has summarized the critical elements of the situation as including the goals (there may be more than one), the elements of the repertoire in terms of their modality (verbal and nonverbal actions and sequences of behavior), the roles (players and positions, leadership, division of labor), the rules governing the interaction (including any sanctions and norms operating), the skills and difficulties needed, the environmental setting (including social prox-

imity, crowding, orientation, color, furniture, decoration, and equipment), and the concepts used, which he refers to (Brownell et al., 1986) as salience dimensions. Such salience dimensions include the personal constructs used by the participants to assess the situation, equivalent to Magnusson's perceived situation dimensions. While Argyle's taxonomy emphasizes the social aspects of the situation, the similarity with the elements noted by Magnusson is striking. Argyle also suggests that two further critical variables in the assessment of situations are whether they are complex or simple, or whether they are familiar or unfamiliar.

The question of social behavior in a situation is also without question critical and there is an extensive literature pertaining to it, but it will not be dealt with in this paper. Many health behaviors (eating, drinking, smoking, sunbathing, seat-belt wearing) may take place in an asocial context, and for this reason, social behavior in the situation will be set aside although not discounted as a further significant source of variance in risk behaviors.

The situation in public health

The significance of the situation can be illustrated by posing a problem. It is not uncommon for risk behaviors to vary from context to context: that is, the person may engage in a risky behavior in one context and not another. Assuming that attitudes and beliefs are relatively constant in the individual, why will the person engage in risk at one time in one place and not at another time in another place? A substantial amount of the variance in risk behavior may be explained by context – others present, contextual cues and pressures, drug use, affects engendered by the context and the recent past. A study of the context may illuminate some of the immediate concomitants of the risk behavior.

Research into health promotion has examined the taxonomy of health behavior-related situations. Analyzing cluster analysis studies of addictive behaviors, Cummings et al. (1980) distinguished three groupings of characteristics: affect, particularly negative affect; social situation, i.e., presence of others; and physical craving (withdrawal symptoms). These can be conceptualized as individual, situational, and physiological clusters. Velicer et al. (1990) evaluated a number of measurement models for smoking relapse situations and also derived three dimensions of situations: positive/social

situations, in which all items described happy affect and relaxing with friends; negative/affective items, implying isolation and stress; and habit/addictive items, reflecting cravings associated with physical or psychological need states. Velicer et al. note the importance of interpreting these data within a stages of change model, where different dimensions apply at different stages of smoking cessation (essentially, a situation by stage model). After cessation, the habit/addiction dimension is the most salient; this is followed by the positive/social as the most salient, and then the negative/affective dimension as an "excuse" to relapse. The interaction of stages of change with the situation is an important point which needs to be taken into account in determining the impact of situational variables.

Social learning theory (Bandura, 1986) recognizes the interactions of behavior, personality, and environment in triadic reciprocity. However, Bandura (1986:26) argues that from the perspective of triadic reciprocity, "*the common practice of searching for the ultimate environmental cause of behavior is an idle exercise*", because the same event can be either an environmental stimulus, a response, or an environmental reinforcer. While this is true if a complete deconstruction of the behavioral components of the situation is sought, Bandura also notes that physical variables and situational constraints may influence behavior. The present model seeks to bring the situation into intellectual salience as a contributor to variance on health behavior rather than to establish ultimate cause. Essentially, the situational model as described in this paper has three postulates: first, that the situation contributes to the variance of explanation of public health risk behaviors; second, that the power of the situation may vary inversely with the degree of individual autonomy and self-efficacy in the situation; and third, that the situation is definable and measurable.

Measurement of the situation

Most approaches to measurement of situations described so far relate to the measurement of the properties of the situation and to a description, often with a view to establishing dimensions to produce a taxonomy of situations, of how subjects rate situations in terms of their global properties. Endler (1981) questions whether we can reliably scale situations in terms of impact, complexity, relevance, objectiveness, and subjectiveness. Magnusson &

Ekehammar (1973) found two bipolar situational dimensions across situations: positive-negative and active-passive, plus a unipolar social factor, which is similar to the findings of Velicer et al. (1990) in terms of their dimension descriptions. However, the central question is not so much the classification of situations as it is the situational variables which shape behavior. The dimensions derived in the taxonomic research are general in nature and do not easily translate into specific situational variables. Endler (1981) has noted the need to investigate real-life situations rather than laboratory ones, emphasizing the importance of the need to provide as realistic a situation as possible for assessment.

Despite criticism of health behavior models for emphasizing individual over situational models, health psychology has also provided vignette methodologies for examining the influence of situation on behavior. While vignettes are one possibility for studying contextual antecedents, the need to vary only a few parameters at a time may restrict their effectiveness. McKeganey et al. (1995) looked at vignettes in over 500 injecting drug users in which social distance from the injecting partner was varied, and found that contextual variables including social distance, gender, and time injecting but not age significantly influenced the tendency to share equipment. The vignettes were simple and contained a brief situation in which only social distance was varied (the other person in the interaction being a sexual partner, a close acquaintance, or a stranger).

In a more complex presentation, Dijker et al. (1997), looking at determinants of fear of people with AIDS, used vignettes where a description of the individual to be rated was provided in a booklet (with a number of experimental parameters varying randomly in the booklets), along with a detailed picture of the room in which the interaction was to take place and the provision (in the picture) of a glass wall between the scene and the room of the individual to be rated, to enable the (imagined) opportunity to stare at this individual. This study helped participants to more vividly imagine the physical and affective conditions under which interaction with the target individual would take place. The use of vignettes to approach realism attempts to situate and "heat" the cognitive process.

A second area of theoretical importance for situational measurement is its opportunity for assessing the role of affect in situational outcomes. Anecdotal reports of risk situations suggest that while cognitions are important in out-

come, they are overridden by affects in some instances, for example sexual behaviors. Affects act to "heat" the cognitions or to override them, and unlike cognitions, which are relatively stable, affects are usually transient and situationally elicited. In order to determine the impact of affects, emotions need to be measured, and their measurement is to a large extent dependent on being able to elicit them in situations which are as realistic as possible. The computerized situational presentation method described here adds a clearly situated interaction, analogous to vignette methodology with enhanced situational cues such as in the study by Dijker, Koomen, and Kok.

Utility of a computer-based situational presentation method to assess predictors of HIV-risk situation response

What is lacking in an attempt to determine the contribution of the situation to the variance in risk behaviors is an appropriate method for measuring situations. Devising a methodology to overcome the problem of altering a situation by intervening in it has led to a number of innovative approaches to data collection. These have included observation of a situation from outside it without the knowledge of the participants (which raises ethical questions) and participant observation. Recall of a situation by the participants is fraught with the difficulties of retrospective distortion and of rationalizations and justifications. We describe here a computer-based methodology of situational presentation (SITPRES) which appears to have some advantages over these two approaches in measuring the situational contribution to health risk in measuring the situational contribution to health risk behavior, although it in turn introduces problems of its own.

In an attempt to overcome observation bias (where the participants' cognitive and decision-making processes cannot be directly measured) and retrospective distortion, a computer program to present situations to subjects for their rating was designed. The principle underlying SITPRES is that to understand the impact of a situation, the dominant environmental characteristics need to be established (through qualitative research or review of existing research) and situations comprised of random combinations of these variables presented for rating the likelihood the risk behavior will occur. The computer screen illustrates a scenario where the dominant environmental character-

istics are represented by seven bars which can randomly vary, thus with each variation presenting another scenario for rating.

In a test of this approach (Kelaheer et al., 1994) subjects were exposed to 20 hypothetical situations which are defined by seven environmental variables on screen (the Figure 1 illustrates a typical screen for assessing predictors of equipment sharing by injecting drug users). For assessing predictors of condom use among homosexual men, we used the following environmental variables:

- Attractiveness of partner
- Degree of intoxication
- Availability of condoms
- How strongly you want anal sex
- How much partner is attracted to you
- Insistence of partner on using a condom
- Amount of time available

These variables are graphically manipulated by increasing or decreasing the length of their representation on a bar graph, and manipulations are made randomly (from a random numbers generator within the program) from one trial to the next on a seven-point scale. Only the highest and lowest values on the scale are assigned lexical labels ("a little" and "a lot"). These environmental variables were derived from pilot interviews and from the research literature prior to development of the program. Two examples are presented to the subject first and demonstrated by the re-

searcher to explain to subjects how SITPRES works.

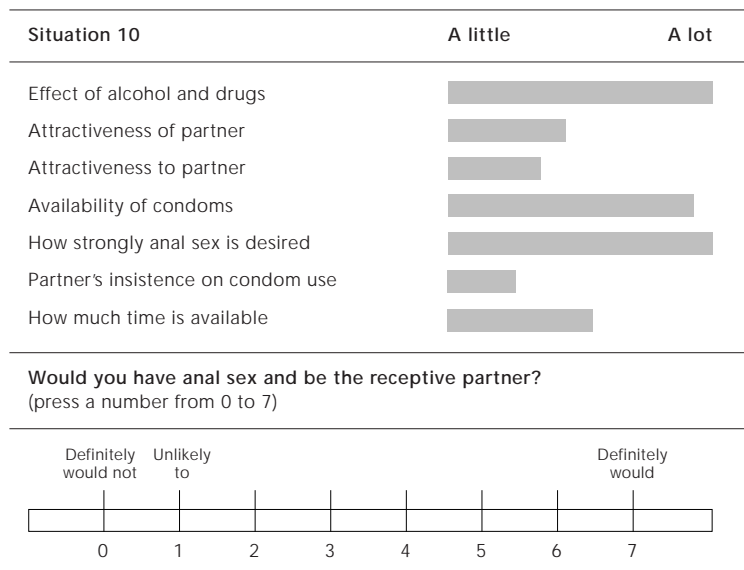
Rating of response variables included: 1) self-reported probability of condom use for receptive anal sex (or sharing needles for the injecting drug example); 2) frequency that actual experience matched the hypothetical situation; 3) if so, time elapsed since an experience like the hypothetical situation; and 4) satisfaction with the decision, again using a seven-point scale. For the homosexual sample ($n = 79$), we accounted for 34% of the variance in safety of sex (Kelaheer et al., 1994), defined by attraction to partner, desire for anal sex, and perceptions of attractiveness to partner (amongst those listed above).

In addition, other measurement scales may also be presented on screen following the situational presentation to permit person-situation interaction approaches to predicting response. In our experience, subjects from a wide range of educational backgrounds are able to use this system, and it has achieved considerably greater acceptability than paper and pencil measures. In addition, it has novelty value and was relatively easy to administer in bars, gay bathhouses, and clinics as well as on the street using a color laptop computer (program available from the author on receipt of blank 3 1/4 inch floppy disk). Analysis by linear regression or canonical correlation, as appropriate, using standard statistical packages, is relatively simple as data are written directly to a floppy disk.

While this program has the advantages of allowing precise presentation of the situation's parameters, randomization of situational parameters to permit multivariate analysis of the independent predictors' contribution, and precise measurement of response, it has several disadvantages. First, the situation is only as realistic as the parameters presented and obviously cannot encompass all the environmental variables present. To a limited extent, this can be overcome by instructions to "imagine oneself in this situation" (although the additional cues provided by imagination are themselves idiopathic and thus a source of uncontrolled variance). Second, the situation is one of "cold" cognition without the variables of (in the two examples presented here) sexual or drug-related arousal (although collecting data on site in gay bathhouses and bars, or in drug clinics, may have provided some realism). There is little prospect of introducing a situation of "hot" cognition without the addition of erotic media and drug administration, although this is certainly a possible development. However, deci-

Figura 1

Example of computer-generated scenario.



sion satisfaction may provide a measure of the gap between “hot” and “cold” cognition. Third, the situation will be accurately rated only insofar as it accurately represents a real life situation, and it is possible, given randomization of variables, that unlikely combinations may arise. To some extent this can be measured by asking the subject the extent to which the situation represents a situation in which the subjects have actually found themselves. However, the computer screen-based methodology also has the additional advantages of being similar to a video game and appearing more anonymous to the respondents since data are written directly to disk.

It is possible, using a triangulation of methodologies such as 1) retrospective recall to assess the cognitive processes utilized in a particular situation; 2) participant or non-participant observation; and 3) a situational presentation system as described here, to gain a picture of the situational and personal variables which may predict response. Our data with injecting drug users and using SITPRES have provided very similar findings to anthropological studies of similar situations: with $n = 84$, we accounted for 88% of the variance in safety of choice (Kelaher & Ross, 1999). The variables were:

- How much you're hanging out for a hit
- How available the drug is
- How well you know the people you're sharing with
- How often you've shared with these people
- How available bleach is to clean needles
- Privacy of place where you hit up
- How high/stoned/drunk you are

The probability of sharing increased as clean needle availability decreased, craving increased, and level of previous sharing with potential partners increased.

These data from two different samples at risk of HIV infection indicate that SITPRES provides a useful methodology to contribute to the understanding of situational determinants of HIV-related risk behaviors, and may guide the content of both policy and educational programs as well as provide evaluation of their effectiveness. It may also be useful to other areas of public health, such as situations in which people overeat or eat inappropriate foods; excessive sun exposure; smoking or use of smokeless tobacco; alcohol and drug use; use of infection control procedures; domestic violence; use of seat belts or occupational safety equipment; and adherence to medication regimens, to identify but a few.

Domains and their elicitation in situational presentations

The domains chosen for presentation in SITPRES should preferably be empirically derived, either from previous studies or from a preliminary qualitative investigation. Ideally, there will be adequate qualitative studies derived from observation, interviews, or focus groups to confirm the main factors perceived to influence the health behavior of interest in the given situation. If not, then the initial stage of the research should be the elicitation of these factors. In some cases, the variable not elicited may be hypothesized to have a subtle impact on the health behavior although not at a conscious level, and there is no reason why such a variable should not be included if previous empirical or anecdotal evidence implicates it. However, elicitation of factors from the population on which the SITPRES approach is going to be tried is advisable.

The “critical incident” approach (Brookfield, 1990; Ross et al., 1993) is a second useful way of eliciting material for designing SITPRES. Brookfield (1990) describes a “critical incident” as a situation or event that is vividly remembered or that holds special significance for the narrator. The use of a particular event, for example the last time a health risk behavior occurred, not only provides an anchor for more accurate memory, but also for recall of the situation in which the behavior was embedded. For example, Leonard & Ross (1997) looked at the last act of sexual intercourse in 400 respondents to a street outreach study, and noted that acts of unsafe sex were likely to be vaginal sex, accompanied by alcohol, marijuana, or other drugs, to take place with new partners, in a hotel or motel in a particular city block, between 8 and 11 PM (or at lunch time), thus providing important clues to both the design of intervention and screening programs and the context of risk behavior.

In situations involving respondents with low literacy or outside traditional North American research contexts, qualitative methods such as a narrative approach may be particularly useful. Kakar (1990) makes a case for asking respondents to narrate what happened in a particular situation or context, and adapting this to a critical incident methodology, asking respondents, for example, to tell the story of what happened the last time an unsafe behavior occurred and where, thus allowing the emphasis and the contextual factors to be developed without needing to provide abstract concepts rather than a situated tale. Kakar suggests that think-

ing in a situated, narrative form is much easier for most individuals – as his sexual relationship histories with lower caste Indian women demonstrate. Thus, either quantitative critical incident measures or qualitative narratives regarding critical incidents can provide information on the situational domains associated with health risk behaviors.

The preliminary empirical research using situational presentations reported above identified a number of domains which may be important across research areas, and which may vary from situation to situation. These include the drive to reach the particular target behavior, the affect and its strength associated with the behavior, and the availability of the materials needed for the behavior (e.g. condoms, needles, sunscreen, particular types of food, cigarettes, alcohol and other drugs, seat belts). The physical restraints of the situation need to be considered which may facilitate or restrict the target behavior, the time available, and the familiarity of the situation, which may have led to the behavior in the situation being scripted (Gagnon & Simon, 1973). The actors are probably the most important variable in situations involving more than one person: they are the domain which most closely interfaces with health behavior theories postulating social learning, role modeling, and peer norms and pressure as significant predictors of behavior. Flay & Petraitis (1994), in their theory of triadic influence, note that social settings or micro-environments can contribute to an individual's health-related behaviors and interact with the attitudes, values, and behaviors of others in the same situation. Essentially, the boundaries of the situation will be in the place, time, and person(s) present, with the attitudes, beliefs, and values of the respondent assumed to be relatively constant within the set of SITPRES stimuli. However, responses of others present can be included, as in the example above from the study by Kelaher et al. (1994), where the attitudes of the partner towards condom use and the degree to which they are attracted to the subject are included, and from the study by Ross & Kelaher (1999), in which one's familiarity with other participants and frequency of prior drug sharing with them are included as variables.

Future applications: virtual reality

The examples presented above are limited by the technology available (at the time of writing, color laptop 486 computers were used). Howev-

er, the future potential of the SITPRES methodology is limited only by the technology available, and we envisage that virtual reality simulations will expand the realism possible in a situation by an order of magnitude. For example, providing actual photographs of an environment, or enabling the subject to move through it on screen and observe it from different perspectives, or adding tactile and auditory input, or having the situation progress in real time, are all within reach and present possibilities for making the SITPRES more realistic. The realism of the situational vignette presented is limited only by the technology, although it is likely that the number of parameters in the situation measured will remain around seven, given that beyond this number, the salience of additional variables may decline. Flight simulators for pilot training already provide highly realistic and closely bounded situations in which behavior can be accurately measured.

Interventions based on situational models

Interventions which are attuned to situational modification must also be considered. There are two principles on which situational interventions may be based. First, if there are clear physical or organizational barriers to reducing risk behaviors, then they should be modified. For example, if uncontaminated needles and syringes are needed in the situation to reduce risk, or if condoms are needed, they should be provided. Sometimes these will need policy changes to implement. Second, changing responses to situations may require a focus on the context – the power of the circumstances surrounding a behavior, its associated affects (“hot” cognitions), and its consequences, thus embedding the situation in a physical, temporal, and affective milieu. Three steps are suggested. The first step is to provide insight into the situations or cues which elicit or stimulate risk behaviors. Both a critical incident methodology and SITPRES provide tools for understanding the variables (or their interactions) which are likely to be associated with risk behaviors. These situations can be presented to the individual, and in addition to providing insight into the situation, they can prepare them to be alert for the development of risk situations. This step essentially involves bringing these variables to a conscious level so that they can function as cues for greater vigilance and, as Gold (1993) has noted, to highlight the danger posed by certain types of situations. Fur-

ther, the role of situationally-elicited affect and emotions can be presented as a set of potential demand characteristics. Frith & Kitzinger (1998) highlight the importance of "*emotion work*" in a feminist analysis of women who make sexual decisions based on the need to take care of men's emotions and to avoid hurting men's feelings. Such "*emotion work*" (management of emotions or "*emotional labor*") functions to provide participants with an understanding of the demand characteristics and emotion-associated risks in sexual situations. Frith & Kitzinger (1998) use this concept to explain women's resistance to date-rape education. They note that in women the emotional largess is usually other-oriented: however, the concept of "*emotion work*" which is used as a self- or situationally-oriented intervention is a useful model for providing some power over the situational "hot" cognitive or affective components. Specifically, it may provide people with an understanding of the emotional factors which may override cognitions in risk situations.

The third step is to use the concept of anticipated regret to re-present the situation and its aftermath. Gold (1993) has noted that with "hot" cognitions, an urgent desire that demands immediate fulfillment is usually set against negative consequences that are much more remote, and thus the urgent desire is likely to loom larger and to be accorded considerable value. The concept of anticipated regret aims to link the situation with the aftermath in the hope that this linkage will survive the heating of the cognitions and that the situation will act as a cue to its recollection. Anticipated regret is not a new concept in public health: van der Pligt & Richard (1994) review the history of this approach and suggest that this may be a stronger predictor of behavior change in males than in females. Anticipated regret is the attempt to influence the time perspective by describing the affect associated with (in the studies of van der Pligt & Richard) having had unsafe sex. The individual is asked to imagine how they feel after having had unsafe sex, when they realize the consequences of the risk they have taken. By making the feelings *after* the event more salient, they found that subjects were likely to report being much more cautious in the future. This manipulation of future time perspective is appropriate for situational interventions because it serves to emphasize the affective and temporal connections rather than focusing on a moment in time disembodied from a situation's antecedents and consequences. Thus, each risk behavior

has been connected with an immediate past and an immediate future to create a risk situation. In addition, a focus on how the person will feel *after* the event is consistent with choice theories which predict that risk-associated decisions may be influenced more by information that emphasizes losses than gains (Tversky & Kahneman, 1974).

The fourth step is one of situational retraining, which is similar to role-play in that it involves a rehearsal of the situation where the individual is lead through the steps of the situation as it develops, with particular concentration on decision points – critical points or places where the direction of the emerging situation can be changed. These decision points should be highlighted by cues (with emphasis on the affective and physical cues, such as arousal, going into a video parlor booth) as well as the cognitive ones. The situational retraining should then be extended to the completion of the situation and anticipated regret examined as the participant leaves the situation, thus making the anticipated regret the proximal focus of the situation. Anticipated regret may thus act as a negative reinforcer to a situation in which there was risk behavior, and a positive reinforcer where the situation was without risk. This approach to situational interventions uses existing approaches to health behavior interventions – the use of the psychotherapeutic concept of insight, the use of cues to behavior, anticipated regret as a means of introducing affect and providing reinforcement, and role-playing to enable the development and rehearsal of the script. However, their combination in emphasizing the encapsulated situation allows for a focus on the entire situation rather than just the de-contextualized personal verbal interactions as often is the case in role-playing. The combination of these approaches into a situation-focused intervention may enable the power of the situation to be more realistically addressed by rehearsing behavior change which has been embedded in a situation – which should also add to the realism of the rehearsal.

Conclusions

In conclusion, the situational model of health risk behavior presented here represents an attempt to provide some theoretical and practical redress to this understudied area. It may be particularly relevant to those communities in which the individual has less power to change, less self-efficacy, and where the locus of control

of action is external rather than internal, or where the culture is based on interdependent rather than independent interactions. Even in circumstances where the individual has a degree of autonomy with regard to health-related behaviors, the situation may add an additional significant amount of variance to the explanation of risk behavior. The situational model is based on four simple premises: first, that the situation is a source of additional explanation of health risk; second, that its importance is roughly inverse to the degree of individual agency; third, that it is measurable; and fourth, that interventions attuned to situational models can be effective where there is significant situational variance in health risk behaviors. It is emphasized that the situational model, as presented here, does not replace any existing theory or model but is complementary: it seeks to add an additional dimension to our understanding of risk behavior. As Keynes (1936:viii) noted in the preface to his *General Theory*,

these ideas "are extremely simple and should be obvious. The difficulty [he notes in the context of monetary policy] lies not in the new ideas, but in escaping from old ones" – in the case of the present model, in conceptualizing the situation as a critical concept in health behavior, and not as in the prevailing models locating the source of the problem solely in the individual. Also presented is a methodology to begin to empirically assess the impact of the variables which comprise the situation, and some empirical data on its performance in assessing situational determinants of HIV-related risk behavior which show it to be a useful research methodology. This has considerable potential to develop into an important research tool as the ability to create increasingly complex and realistic situations using computer technology and "virtual reality" scenarios expands. Context and situation are important domains of health risk behavior and offer additional explanatory power to existing theoretical approaches.

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