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Contextual Influences on Adolescent Risk Behavior: Mass Media

Background Paper by

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INTRODUCTION/OVERVIEW

Throughout our lives, we are inundated by media influences whether self-selected or imposed upon us by others. The media influences are varied and increasingly variable. Older cohorts usually had only radio or print media whereas younger cohorts face what many older cohorts would probably regard as a bewildering array of options ranging from print to Internet-based interactive media. Older cohorts could select a particular newspaper to read or a radio station to hear whereas younger cohorts routinely can select options to match their whims. Contemporary adolescents interact with a media environment that is ever-more saturated with messages about sex and that often appears to condone risky behaviors ranging from unsafe sex to smoking to casual drug use. Policymakers face a daunting task when they endeavor to lower adolescents' risk behavior. Indeed, a recent survey of meta-analyses examining health promotion interventions suggests that adolescents exhibit less change than older individuals, often exhibiting no behavior change compared to control groups (Johnson, Scott-Sheldon, & Carey, 2010b). Yet the impact of health promotion campaigns with adolescents also varies widely and appears to depend reliably on many factors. To the extent that one can generalize and extend these findings, hopes may rise that media campaigns can more effectively reduce adolescent risk behaviors.

If adolescents' behaviors are to be changed, then relevant determinants must be changed, which supports a focus on psychological variables related to behavior. A great deal of research with emerging adults has supported several theoretical frameworks on the social psychology of attitude change, even if research to date has unfortunately neither focused to any great extent on adolescents nor taken full advantage of these theories when it has focused on them. In parallel, a great deal is known about the psychological and behavioral stages adolescents experience and embody on their path from childhood to adulthood. The primary purpose of this report will be to create useful, logical bridges between these two literatures. The heart of this paper is its **first section**, which details attitude change theories including the Yale information processing model (and related research on inoculation effects), the elaboration likelihood model (ELM), heuristic-systematic model (HSM), the unimodel, and the cognition-in-persuasion model (CPM). In discussing these models, I make extensions to adolescents, making predictions about what patterns should occur depending on the target audience's developmental stage. Obviously, if research on emerging adults has generally supported these frameworks, one can expect that extant models will have their greatest difficulty with younger audiences, who are known to experience marked neurological changes in the transition from children to adults. Of particular note are the facts that (a) early adolescents experience increased reward-seeking especially in the face of their peers, (b) adolescents steadily gain self-regulation skills and (c) intellectual ability into their mid-20s (Steinberg, 2008), patterns that parallel the finding that (d) adolescents have lower emotional intelligence than adults (e.g., Mayer, Caruso, & Salovey, 1999). Evidently, the mechanisms for such patterns concern dramatic neurological changes in the prefrontal cortex and limbic brain regions, coupled with ecological stressors that appear in diverse mammalian species including humans (Spear, 2000). The reverse implication that emerges from considering both the persuasion and the developmental literatures is that theories of attitude change should pay greater attention to the developmental stages of targeted audiences. Other implications are also developed, including the limited range of samples considered in persuasion research to date.

For a complete media strategy to develop, one must consider all of the critical determinants of risk behavior. **The second and concluding section** of this paper considers alternative approaches to media influences that may have consonant or divergent implications to attitude change models. These evidence-based alternatives derive from a broad set of disciplines, ranging from epidemiology to sociology to developmental psychology, and help to put the potential of successful attitude change into

perspective. This section will review factors that affect risk taking in adolescence and list some basic principles about media influences that have emerged from applied fields (e.g., HIV/AIDS risk behavior and prevention, pregnancy prevention, smoking initiation, continuation, and cessation). This section addresses principles of audience segmentation, targeting, and tailoring consonant with the reviewed approaches and cognizant of the presence of multiple forms of electronic communication (Internet, texting, etc.). I describe how communication theory and social marketing principles can be used to frame and design prevention messages. This material will also provide guidance for determining what to say, how to say it, when to say it, where to say it and when to say it in message design. This section will also address practical issues that must be addressed if health promotion campaigns for adolescents are to have maximal effectiveness.

Social-Psychological Approaches to Media Influences

Media influences are often conceptualized as being primarily mediated by attitude changes that take place in audience members who experience the attempts. *Attitude* is typically defined as “a tendency to regard a particular entity with some degree of favor or disfavor” (Eagly & Chaiken, 1993, p. 1).

The Yale Model of Persuasion and McGuire’s Variant

The Yale Model. Operationalizing Harold D. Lasswell’s (e.g., 1948, p. 37) classic statement that the communication process could be captured by the phrase, “who says what in which channel to whom with what effect,” the Yale school systematically examined aspects of this process (e.g., Hovland, Lumsdaine, & Sheffield, 1949; Hovland, Janis, & Kelley, 1953). The group systematically broke down the persuasion process into the steps of this statement, attempting to hold other elements of the process constant while varying another part and examining its persuasive impact as an independent variable. As but a brief sample of the strategy, studies manipulating communicator credibility addressed “who says”; studies on fear appeals, order effects, and sidedness of communications addressed “what”; studies on a series of individual difference features in adult samples addressed “whom”; and different dependent variables were investigated within and across studies to address the “what effect” portion of the statement. Although the “whom” segment of the statement might have been adolescents, and the “who” portion might have been their parents or peers, the Yale group only rarely sampled from adolescent populations in their experiments and rarely, if ever, considered explicit developmental principles in relation to attitude change. In general, the Yale group was not tied to any particular theoretical perspective about what patterns should occur and why, although they often adopted behaviorist perspectives. As Eagly and Chaiken (1993) discuss, many critics even regarded them as atheoretical. Consequently, the implications of this framework for adolescents are unclear, but their approach at least helped to organize thinking about the elements of the persuasion process. Indeed, the Lasswell units are still widely used in work on attitude change.

Information processing model. Although most in the Yale group assumed that message recipients passively received and integrated information, McGuire’s information processing theory maintained the Yale group’s emphasis on steps involved in persuasion (Hovland, 1959) while simultaneously embracing an active role by the participant. Although versions of McGuire’s reception-yielding model had more or less steps across three decades of development (cf. McGuire, 1968, 1989), each included three main steps: (a) attention, (b) comprehension, and (c) yielding. For a message to have any impact, one first had to attend to it, comprehend it, and finally one could agree or disagree (yielding); if any factor interfered with the completion of a step, then persuasion could not occur. Consistent with the Yale group’s conceptions of persuasion processes, McGuire acknowledged the moderating roles of ability and motivation to “receive” information, ideas that became foundational for modern models of persuasion.

McGuire (e.g., 1964) confirmed an important factor that reduces yielding: Specifically, exposure to the weakened dose of opposing arguments coupled with a refutation permits participants to retain their initial attitudes. Subsequently, such participants show an *inoculation effect*, greater resistance to the full dose of opposing arguments compared to participants who were not so inoculated. Inoculation theory asserts that people can resist attitude change if they are trained to consciously generate responses to anticipated persuasive messages targeting a particular attitude or value (e.g., Bernard, Maio, & Olson, 2003; Sagarin, Cialdini, Rice, & Serna, 2002). It is plausible that, in many instances, widespread media presentation of unsafe behaviors as normative and acceptable inoculates adolescents against health promotion messages soliciting the reverse behaviors (this dimension is addressed in the next section). Whether this inoculation effect is solely through the yielding function or may be to some extent through the reception function is not clear. What is clear is that contemporary, increasingly message-dense environments make issues of attention increasingly important.

In the information processing model, some variables can have contrasting effects on the two different processes. High intelligence, for example, might increase reception (because it enhances comprehension) but decrease yielding (because it enhances skepticism), a pattern that Rhodes and Wood (1992) meta-analytically confirmed. This research implies that for early or pre-adolescents, reception of complex argumentation will be minimal, due to lowered ability to receive information, but that yielding will be maximal. By the time adolescents reach a late stage, the growing intelligence that results with maturation and education should result in the predicted pattern of increased skepticism and decreased yielding. To date, it appears that no study has examined this prediction.

Research has shown that the actual sequence of processes implied by the information processing models is not always so linear. Message recipients might skip the comprehension phase altogether and yield based on simple attention to the target (McGuire, 1968). Similarly, intriguing evidence with emerging adults suggests that comprehension of a phrase instantaneously elicits its acceptance, which only later is modified if more deliberate thinking concludes that a correction is necessary (see Gilbert, 1991), similar to Tversky and Kahneman's (1974) anchor-and-adjust heuristic. Similarly, Edwards and Smith (1996) showed that arguments disconfirming one's beliefs receive greater scrutiny, which suggests that sometimes message recipients re-start the sequence. These complications diminish the use of the information processing perspective as a theory in persuasion, even if its applications to stages of adolescents are ripe for consideration.

Contemporary Process Models of Persuasion

With few exceptions, models of persuasion developed from the 1940s to 1970s assumed explicitly or implicitly that attitude change is simply a matter of drawing a logical conclusion for message recipients. This emphasis seems to assume that mental and behavioral life is relatively reasoned and volitional (cf. Fishbein & Ajzen, 1975; Eagly & Chaiken, 1984). In contrast, the possibility that mental life may often be neither very reasoned nor all that volitional has recently taken center stage in persuasion research, as it has in a range of theories across several disciplines (see Chaiken & Trope, 1999). Indeed, an emerging consensus considers mental and behavioral life almost completely driven by automatic and relatively non-conscious processes that are either evolutionarily ready for quick responding or that literally develop across the lifespan (Bargh, 2006; Bargh & Ferguson, 2000; Baumeister, Muraven, & Tice, 2000).

Contemporary models of persuasion concur that recipients often process messages in ways that economize on time and energy, but reserve the possibility that recipients may expend considerable energy processing message-relevant information. Specifically, four contemporary process models, the elaboration likelihood model (ELM; e.g., Petty & Cacioppo, 1981, 1986; Petty & Wegener, 1999), Heuristic-Systematic Model (HSM; Chaiken, 1980; Chaiken, Liberman, & Eagly, 1989; Chen & Chaiken,

1999), unimodel of persuasion (Thompson, Kruglanski, & Spiegel, 2000), and the cognition-in-persuasion model (CPM; Albarracín, 2002) explicitly contrast relatively effortful modes of cognition with those that are much less effortful. Table 1 provides comparisons of these four models along several dimensions. Of these process models, only the ELM and HSM explicitly posit qualitatively different dual processes; the other two models posit one process or a process sequence that accounts for both low- and high-effort contexts, which the theories examine in terms of ability and motivation to think about the communication. Use of each model has implications for how adolescents at different stages should react to mass media.

Elaboration likelihood model (ELM). The ELM is named for its *elaboration continuum*, a motivational factor that determines the extent to which processing of message content is likely to occur (Petty & Cacioppo, 1986). Essentially, the ELM asserts that people's thoughts determine attitudes under high elaboration circumstances. High elaboration occurs when message recipients have sufficient ability and motivation to process the message. In such cases, recipients carefully scrutinize the information value of the message for clues about its validity; messages with strong arguments persuade and those with weak arguments should not. In the terms of the model, message participants follow the *central route* to persuasion, basing their attitudes on critical thinking related to the information in the message. If the information is strong—that is, if it elicits primarily positive cognitive responses—then attitudes should change toward the appeal. In contrast, if the information is weak—that is, if it elicits primarily negative cognitive responses—then attitudes should move away from the appeal. Researchers have customarily used manipulations of strong vs. weak messages, often pretested to produce the desired cognitive response profiles, in order to detect and to gauge the impact of high elaboration on persuasion (e.g., Johnson, 1994; Petty & Cacioppo, 1979; Petty, Cacioppo, & Goldman, 1981). Because younger adolescents generally have less ability to think critically, one can expect that processing through the central route occurs less often than alternative processing.

Under low elaboration circumstances, when ability and motivation are low, a host of other non-message-content dimensions determine reactions. In terms of the model, low elaboration message participants follow the *peripheral route* to persuasion. The long list of factors known to act as *peripheral cues* includes such dimensions as the attractiveness or credibility of the communicator, the recipient's mood, and the length of the message presented. Such factors often have been shown to have an impact only under low elaboration circumstances (see Petty & Wegener, 1998a, for a review). A great deal of research has supported the central ELM predictions that (a) argument quality should matter more under high elaboration circumstances and that peripheral cues should not, and (b) argument quality should not matter under low elaboration circumstances but that peripheral cues should (for reviews, see Eagly & Chaiken, 1993; Johnson et al., 2005; Perloff, 2003; Petty & Wegener, 1998a). The ELM also predicts that attitude change through the central route should be longer lasting and more predictive of behavior than attitude change through the peripheral route, a pattern found in several studies (see Petty, Haugtvedt, & Smith, 1995, for a review). This work also yields the prediction that younger adolescents' attitudes should be relatively pliant and not that strongly predictive of behavior, and that attitude-behavior relations should gradually become more stable as adolescents emerge into adults.

Although little research has directly tested these hypotheses with adolescents, the prediction is clear that peripheral cue factors generally should be more powerful for early than for late adolescents, who have not yet developed strong cognitive control over impulses (e.g., Steinberg, 2008), and that central route persuasion in isolation should be relatively ineffective. Of course, attitudes may change in response to strong arguments, but one would only expect this outcome if the message is accompanied by consistent peripheral cues to change; under such circumstances, it would be processing of the peripheral cues that mediates observed change, not the arguments. This background also leads to the

clear prediction that peripheral cues should have stronger impact for younger adolescents than those in late adolescence. The impact of cues that elicit positive moods, social acceptance, and vividness should all be stronger for younger audience members than for older adolescents.

These conclusions align well with contemporary practices with advertising for children, which usually has little argumentative content and instead relies heavily on non-verbal cues. Marketers present images that make their products appear enjoyable and that show others happily interacting with the products; these messages often imply social success if one has the product in question. Kids are more popular, in essence, if they can show off with the product with their friends. In contrast, late adolescents should function more like emergent adults (e.g., Steinberg, 2008). This group should still be subject to peripheral cue factors (as all of us are), but central route persuasion is a more likely route of change.

Here it is important to emphasize that that ELM also stipulates that high elaboration requires not only that recipients must be able to process the message, as we have emphasized to this point, but also *motivated* to process it. Older adolescents will have greater ability to process because through personal and collective experiences, they are developing increasingly complex and stronger cognitive strategies for coping with reality. But greater ability to process does not necessarily imply greater motivation to use these strategies. Older adolescents may have developed the capacity for abstract reasoning, but that doesn't mean that they want to use it.

The ELM recognizes that certain other factors may interact with the variables discussed to this point. Although in general the ELM assumes relatively objective message processing on the part of the target, other variables can bias processing, which predisposes a message recipient either to disconfirm or to confirming the message position. Knowledge, prior attitudes, need for cognition, and other individual differences can predispose a message recipient to relatively biased processing (see Briñol & Petty, 2005, for a review).¹ Because they have less experience that would lead to these biasing circumstances, one can predict, therefore, that younger adolescents will be more likely to process messages in an open-minded fashion, but that as they emerge as adults, biased processing should be more and more likely.

In sum, the ELM generally suggests that relatively simple positive peripheral cues will change attitudes under low elaboration conditions but that under high elaboration conditions, the cues will lose their impact and central cues (considerations of the messages presented) will matter most. As an extension, younger adolescents should be more susceptible to peripheral cues and be only superficially susceptible to central cues; older adolescents should be less susceptible to peripheral cues and increasingly able to process central cues.

Heuristic-systematic model (HSM). Simultaneous to the development of the ELM, Chaiken and her colleagues (1989) borrowed cognitive psychology concepts to develop the HSM, which contrasts how message recipients may deploy systematic or heuristic processing or both in the service of a processing goal that may be accuracy, defense of a prior attitude, or an impression conveyed to others. The HSM's *systematic processing* construct is analogous to processing in the ELM's central route, with the emphasis on analytical thinking with regard to message-relevant information. According to both the ELM and HSM, when ability and motivation are high, message recipients ought to engage in considerable systematic processing and, similar to the cognitive response model, the valence of their thoughts ought to be highly predictive of their attitudes (Table 1). Thus, the HSM makes the same

¹ Moreover, variables can potentially play multiple roles within the ELM, influencing elaboration, acting as arguments, or acting as peripheral cues. For instance, expertise information is typically considered a peripheral cue, but it may be processed as an argument that increases persuasion (Petty, Wheeler, & Bizer, 1999).

predictions about systematic processing as the ELM does regarding the central route. For example, when motivation to attend to message content is high, strong arguments produce more persuasion than do weak ones (Martin & Hewstone, 2001). Consequently, the HSM has similar ramifications for media effects in adolescents as does the ELM. In this sub-section, I will develop some other implications.

Heuristic processing, in contrast, is the application of cognitive if-then rules to decision making; for example, people usually follow the rule that *attractive people are trustworthy*. When ability or motivation are low, and a source who is obviously an expert presents the message, then this heuristic will likely be used to determine attitudes toward the message's recommendation. For example, source credibility but not argument quality influenced Ito's (2002) low-involvement message recipients' attitudes (see also Bohner, Ruder, & Erb, 2002; Kiesler & Mathog, 1968). If adolescents, and especially early adolescents, may be regarded as generally having low involvement, then one should generally not expect message features such as argument quality to affect attitudes a great deal.

The HSM has received a great deal of attention as a model of persuasion (Eagly & Chaiken, 1993; Perloff, 2003) and has even been developed into a more general judgmental model (Chen & Chaiken, 1999). Scholars have often misconstrued the model as essentially equivalent to the ELM: Although the ELM and HSM do indeed make the same predictions about persuasion in many popularly examined contexts, this parallelism should not be taken to mean that the models are identical. For example, although the HSM agrees with the ELM that validity-seeking or accuracy is the primary processing motive that drives processes, the HSM also posits that message recipients may sometimes have defense or impression motives that drive and bias processing. Because research has shown early and middle adolescents to have heightened sensitivity to gaining social acceptance, one can predict that impression-motivated processing will be a more powerful driver of attitudes for these groups than for older groups, although it should be noted that even emerging adults have displayed such effects. For example, Johnson and Eagly's (1989) meta-analysis showed that impression-motivated university students who did not know the position of their interaction partners maintained relatively neutral opinions after receiving messages, even when the messages contained strong arguments.

The HSM hypothesizes that defense motive occur when the message recipient has a great deal of confidence in his or her position and sees the message as contrary. Emerging adults who exhibit defense-motivated processing might be regarded as having value-relevant involvement with the issue. Such individuals have been shown to resist persuasion to a much greater extent than people with low involvement, even in the face of very strong argumentation (Johnson & Eagly, 1989). Essentially, people exhibit biased interpretation of evidence, testing hypotheses in a one-sided way that supports their initial attitude; they have even higher standards for evidence for hypotheses that go against their current expectations (e.g., Hovland, Harvey, & Sherif, 1957; Lord, Ross, & Lepper, 1979). Theory suggests that these value ties generally occur over long periods of time, suggesting that younger adolescents should be less likely to have this form of involvement. Again the implication is that, generally, younger adolescents will be easier to persuade than older adolescents. Only when children and adolescents invest significant time developing a knowledge base relative to a particular problem should this form of defense-motivated processing result.

The ELM (e.g., Petty & Cacioppo, 1986) has tended to portray message recipients as to following *either* the central or the peripheral route to persuasion. In contrast, the HSM explicitly predicts that in situations conducive to both modes of processing, both will occur (Eagly & Chaiken, 1993). Supporting this *additivity hypothesis*, Ito (2002) found that argument quality and source credibility each affected attitudes under conditions of moderate motivation. Thus, in contrast to the ELM, the HSM requires no necessary trade-off in using these two processes, and studies support the conclusion that heuristic and systematic processing may appear in parallel (e.g., Bohner et al., 2002; Chaiken & Maheswaran, 1994;

Ito, 2002; Sengupta & Johar, 2001). These findings have strong implications for adolescents, who as noted may often have reduced motivation and ability to process messages. One ought to witness the impact of heuristics such as “if it feels good do it” even when adolescents deploy some systematic processing about message content. To the extent that these cues align, then attitudes should adjust accordingly.

Finally, another difference between the HSM and the ELM is in regard to its status as an instantiation of dual-process model (Bargh & Ferguson, 2000). Unlike the ELM, the HSM truly is a dual-process model, specifying heuristic and systematic processing as two qualitatively different processes involved in persuasion, whereas the ELM contrasts two general *classes* of processes (see Johnson, Maio, & Smith-McLallen, 2005, who review criticisms for this and other models). Whereas the central route might be characterized as involving one process (cognitive responding), Petty and colleagues include many processes in the peripheral route, including classical conditioning, operant conditioning, attributions, heuristic processing, and so on. Moreover, the HSM specifies that deficits in actual relative to desired confidence drive systematic and heuristic processing. That is, people engage in systematic processing when they desire a higher confidence level than they can attain through relatively effortful, heuristic modes of processing. Thus, either or both increases or decreases in desired confidence promote systematic processing, which is consistent with recent work (e.g., Rucker & Petty, 2004; Tormala & Petty, 2002). As an extension, it seems clear that people may rely both on internal and external cues to determine whether their level of confidence is sufficient, or will *satisfice* as Simon (1957) put it. Logically, early and middle adolescents should be especially likely to take cues from similar others to decide whether their attitudes on an issue need adjustment and thus whether to take a message seriously and process it systematically. The implication is that the inclusion of desirable models who spontaneously and genuinely respond in a message-friendly fashion will elicit not only the heuristic that popular kids are right but also the heuristic to take a third party seriously.

Unimodel. Though dual-process models are the most widely used theoretical perspectives in persuasion research, Kruglanski and his colleagues (Kruglanski & Thompson, 1999; Kruglanski, Thompson, & Spiegel, 1999) recently argued for a more parsimonious single-process model, the *unimodel*. This model takes as its starting point Lay Epistemic Theory (Kruglanski, 1989), which addresses the processes governing the formation of subjective knowledge (e.g., judgments, opinions, attitudes, and impressions). Specifically, persuasion is a process of hypothesis testing and inference that is influenced by (a) the structure of the evidence presented, (b) cognitive-ability factors that affect inferential activity, and (c) motivational factors impacting the extent and direction of information processing and persuasion. The unimodel stipulates a number of influences on the persuasion process, but unlike the HSM and ELM dual-process approaches, the unimodel argues for a single-route to persuasion that treats central/systematic and peripheral/heuristic routes as incorporating functionally equivalent types of evidence. *Evidence* is any information relevant to the conclusion and may be understood as an if-then linkage between relevant information and possible conclusions. *Relevance* means that the information is pertinent to the conclusion that a person makes. Evidence can be processed explicitly or implicitly in relation to the idiosyncratic knowledge goal. Clearly, the unimodel was developed with adults in mind, suggesting that full-blown epistemic thinking will not often emerge until late adolescence. Alternatively, the unimodel suggests that even children and early adolescents will think epistemologically in relation to messages they receive, but that the thinking will be relatively unsophisticated and more likely to use faulty heuristics (Table 1).

According to the unimodel, elements of the message itself (e.g., quality, complexity, and humor), source information (e.g., attractiveness and powerful speech patterns), and context variables or environmental cues (e.g., ambient noise, lighting, and message modality) can all be considered relevant

to the conclusion or conclusions that a person makes about the promoted issue. There are no a priori differences in degree of relevance in the two types of information specified by the ELM and HSM because the overall importance of each may differ across contexts or issues. Based on the assumption that there is only one broad process at work, the unimodel holds that availability and accessibility of relevant information are important to the persuasion process but that whether they occur centrally or peripherally is immaterial. Like the ELM and HSM, the unimodel also acknowledges the importance of motivation to process information. Unlike dual-process models, the unimodel considers motivation as important only to the extent that some motives affect the extent of message processing (e.g., need for cognition or motivation for accuracy) and others impact the direction of processing (e.g., ego-defensive or ego-enhancing motives), but they do not interact with the evidential category (e.g., heuristic cues or message arguments). The primacy of relevance judgments in the unimodel makes it essentially a functional theory of attitude change similar to those of Katz (1960), Kelman (1958, 1992), and Smith et al. (1956). These theoretical approaches to attitudes and attitude change emphasize how message recipients' goals relate to what information is considered relevant (Kruglanski, 1989) or legitimate (Kelman, 1992) and how that information is interpreted.

Despite the appeal of the apparent parsimony of the unimodel over the ELM and HSM, comparatively few published studies have documented the validity of its claims. Although the unimodel and the handful of studies providing support for it allude to some problems with the dual-process tradition, the lack of published evidence limits conclusions about the import of the model. Moreover, as Wegener and Carlston (2005) review, the ELM appears able to explain key predictions of the unimodel. Of particular note is the fact that, in the ELM, variables can play several roles: Whereas the unimodel would emphasize the epistemic implications of received information to the recipient whether the information is source-specific or message content, the ELM would argue that even source information can serve as an argument under certain circumstances (e.g., Petty et al., 1999). For example, cues that typically have appeared in abbreviated forms in past persuasion research were made more salient by providing more information about them (Piero, Mannetti, Kruglanski, & Sleeth-Keppler, 2004). As another example, providing more elaborate information regarding the degree of consensus (cue) often affected the attitudes of high-relevance recipients, even in the face of traditional argumentation. The pattern especially occurred when the cue information followed the argumentation, a pattern that Piero and colleagues labeled a *relevance override*. It appears that these results square with the assumptions of all contemporary process models, not just the unimodel.

Cognition in persuasion model. Taking inspiration from social cognitive theories (e.g., Srull & Wyer, 1989), Albarracín's (2002) cognition in persuasion model (CPM) details a series of processing stages that underlie persuasive effects that usually appear in a particular temporal ordering. Briefly, in stage one, a message recipient initially *interprets* the presented information in semantic terms using permanent memory. In stage two, the recipient *identifies* the information in the message or other information available at the time in order either to validate or to refute the information. In stage three, the recipient generates potential bases for judgment and then *selects* the most relevant information for use. In the fourth stage, the recipient *uses* the selected information in his or her judgment, which may modify attitudes or intentions to engage in relevant action. In the fifth and final stage, the recipient may *act* on their attitudes and intentions.

Like the unimodel, the CPM eschews the classic dual-process distinctions of the ELM and the HSM (see Table 1) and embraces to some extent McGuire's (e.g., 1969) information-processing theory of persuasion. It specifies that cognitive processing stages underlie persuasive effects regardless of ability and motivation levels. For example, Albarracín and Wyer (2001) showed that when distracted, participants relied on the affect induced by the message content as a basis for their attitudes rather

than the content of the message itself. Moreover, the cognitive processes involved in forming judgments were quite similar at both high and low levels of elaboration, but the order of the stages and the information used in case were distinct. Although distracted participants were able to make judgments of likelihood and desirability of outcomes suggested in the message, they were unable to combine them to form the basis for their attitudes; instead, they used the affect attributed to the message to rationalize their mood-based attitudes. Non-distracted participants also made judgments of likelihood and desirability of suggested outcomes but were able to combine them such that the implications suggested by the message became the primary basis for their attitudes.

Similar to McGuire's (1969) reception-yielding model, other variables can affect the likelihood of any particular stage promoting persuasion, meaning that some persuasion variables may have non-linear effects on persuasion. For example, on the basis of the CPM, Albarracín and Kumkale (2003) predicted and found that emerging adult participants were more likely to use their moods as judgment cues under conditions of moderate thought than under either higher or lower levels of thought. The CPM's rationale is that two stages are involved in the selection of affective information. For example, for mood to have an influence, people must identify it but must not conclude that it is irrelevant as a source of evaluations of the message proposal. Consequently, mood has greater impact when ability and motivation are as high as is necessary to induce identification, but not as high as to induce discounting of the affect. Thus, in contrast to the ELM or HSM, the CPM predicts that extra-message cues are more likely to affect persuasion under conditions that promote moderate rather than either small or large amounts of message-relevant thinking. These results are again suggestive that adolescents will exhibit larger emotion effects, given that extent of elaboration is likely not often to exceed moderate levels.

In contrast to the ELM and HSM's treatment of prior knowledge as a potential moderator of the amount of deliberative processing in which a message recipient engages upon presentation of a persuasive message, the CPM views prior knowledge as a biasing filter through which information passes. Accordingly, Albarracín's (2002) review of studies suggested that people access only those memories and concepts that are relevant for understanding the content of the persuasive message at hand. For example, Albarracín and Wyer (2001) compared judgment-relevant dimensions that were either present in the message arguments or not present and therefore only memory-based; path analyses revealed that message-present dimensions linked more closely to attitudes than memory-only dimensions.

Relative to the other process models, the strengths of the CPM are at least two: (a) it offers very specific processes that underlie persuasive effects; and (b) it attempts to integrate reception and yielding, whereas the other models appear to be primarily theories of yielding. Granted, the ELM, HSM, and unimodel each specify some role for reception variables, but these roles are relatively passive. As Table 1 shows, the CPM maintains the predictions that the other models make about persuasion in high vs. low motivation and ability settings, but makes novel predictions about moderate motivation and ability settings, which are conditions that should appear quite often for adolescents in early and middle stages. Indeed, the CPM's prediction that behavior is more likely to align with messages when strong arguments are presented temporally near the action itself seems nicely exemplified by adolescents' marked tendency to bow to peer pressure. As research evidence mounts, one may well see that the CPM's predictions are even better supported in adolescent research than in research with adults.

Summary and Critique

Sophisticated models of persuasion have appeared over the last 50 years but have been evaluated almost entirely with samples of emerging adults rather than adolescents. Nonetheless, these perspectives yield differential implications for media effects for adolescents at varying stages of development. It is known that early adolescents, in particular, have less control over emotional impulses

and that they have relatively unsophisticated thought content and processes (Mayer et al., 1999); it is known that later adolescents increasingly exhibit the sophisticated thought content and processes of adults (Steinberg, 2008). Table 2 organizes implications of these models for adolescents receiving media efforts and shows how different effects should have greater prominence at different developmental stages. For pre-adolescents, one should see that (a) emotional and other nonverbal cues are powerful relative to pure information (e.g., complex, strong arguments); (b) attitudes and acquired habits related to behavior are weak; and (c) skepticism is rare. For early to middle adolescents, one should see that (a) emotional cues decrease slightly in power and information cues become more powerful, (b) information processing is driven by impression motives, and (c) attitudes become stronger and habits accrue. Finally, late adolescents should resemble adults: (a) Emotional cues remain important, but information can overwhelm them; (b) attitudes are often strong and can be defended, and (c) skepticism is common. At least four limitations relative to the application of models of persuasion to adolescents must be elaborated:

1. *External validity.* The models have been evaluated almost exclusively with emergent adults, which limits sharply the empirical generalizations that can be made for adolescents (indeed, the same conclusion may be made about the models generalizing to older adults). The samples studied have also rarely utilized any population except convenience samples of university students who are known to differ from other populations in meaningful ways (e.g., Sears, 1986). The extent to which the theoretical implications generalize is currently not known.
2. *Developmental challenges to contemporary theories of persuasion.* Models of persuasion feature variables such as epistemic thought whose existence must rest on considerable experience over long developmental spans. Nonetheless, to date, the theories have not yet revealed sophisticated conceptualization for these dimensions and this prospect remains a tantalizing direction for future scholarship. For example, developmental considerations throw strong doubt on the models' prediction (Table 1, bottom row) that behavior change is more likely following intensive processing of strong arguments. If younger adolescents do not process argument cues well, then it seems more likely that for them behavior change should more often follow the presentation of positive persuasion cues. Similarly, it is rare to see developmentally linked variables brought to bear on persuasion *per se*. For example, attachment theory has been brought to bear on some health promotion results (e.g., Patton et al., 2000), but apparently not in relation to persuasion *per se*.
3. *Lack of longitudinal designs.* Similarly, little social psychological research on attitudes directly examines longitudinal changes in target populations, even in samples of emergent adults. These studies tend to focus on single sessions no longer than about 30 minutes and are often even briefer. Follow-up assessments are rare. Some social psychological research on attitudes *implies* long developmental trajectories, such as work on implicit attitudes (e.g., Rudman, 2004), attitude strength (e.g., Visser & Krosnick, 1998), and involvement (e.g., Johnson & Eagly, 1989). Yet almost none of it actually establishes the developmental trajectories implied.
4. *Shortcomings of the evidence that does focus on adolescents for theories of persuasion.* Adolescents have been the focus of many intervention efforts (e.g., see Johnson et al., 2010b). Some of this research has taken the form of tight social psychological experiments similar to those that evaluated all of the models discussed in this section. Nonetheless, even when adolescents have been the population examined, scholars have rarely taken advantage of persuasion models to make predictions that also depend on the developmental stage of their target population (for an interesting exception see Gerrard et al., 2008). Most research that focuses on adolescents has pursued other models of social influence and research designs that

obscure whether the processes implied by the models reviewed in this section are at play. Nonetheless, some of this research has implications for media effects with adolescents and will be considered in the following section.

In conclusion, these limitations strongly suggest that the predictions reached in this section should be considered future directions for research rather than confirmed evidence-based conclusions.

Alternative Conceptualizations of Media Influences on Adolescents

Even without considering alternative conceptualizations of how the media may influence adolescents, the first section makes clear that extant persuasion models cannot be regarded as capturing *all* that one needs to know to change adolescents' health behaviors or to maintain health behaviors. They have in mind relatively constrained circumstances, brief encounters with messages delivered over some medium. Although people face 100s or 1000s of such encounters every day, especially given the large array of media in today's environment, for adolescents and even people at other stages of life, reality is more complex than these conceptualizations imply, consistent with classic and contemporary developmental and ecological perspectives (cf., e.g., Bronfenbrenner, 1979; DiClemente, Salazar, & Crosby, 2007). This section will consider some alternative conceptions that bear strongly on media influences on adolescents and endeavor to put the influence of the variables in the prior section into perspective. In so doing, it will also generate some implications about how best to segment populations, and to target messages.

How Much Media-Related Change Is Possible?

A broader picture on media influences on adolescents emerges from many literatures and from many cumulative efforts to promote adolescent health. A comprehensive survey is beyond the scope of this report, but a sampling will give a sense of the factors at play. In contrast to the apparent simplicity with which behavior can be changed based on the theories of persuasion, practice often defies this statement. Johnson et al. (2003) reviewed relatively intensive interventions to reduce risk of sexually transmitted HIV in adolescents, who were usually non-institutionalized and predominately sexually active. These programs varied from 1 session to 50 sessions; they were as brief as 5 minutes total and as long as 42 hours; they often used elicitation research to generate the content of the interventions. Content also varied widely, with some trials incorporating school-based sex education, some with condom-skills training, and some with other predominant content. Some trials provided condoms. They generally took measures of condom use or sexual frequencies at some distance from the intervention, about 14 weeks after the intervention ended. Overall, interventions had a very small (but significant) impact increasing condom use ($d = 0.07$) and decreasing the frequencies with which adolescents had sex ($d = 0.05$).

These mean effect sizes lie in the middle of a range of effects shown for adolescents more generally; health promotion meta-analyses focusing on adolescents have yielded smaller effect sizes (ranging from -0.11 to 0.29) than those focusing on adults, even within the same content area (Johnson et al., 2010b). Table 3 lists meta-analyses focused on adolescents that Johnson et al. (2010b) reviewed; these efforts have focused entirely on sexually related behavior. Other health promotion meta-analyses in this sample had did not isolate differences for adolescents and had overall samples with mean ages outside of the adolescent range (12 to 18 years). Other more recent meta-analyses have isolated adolescents from adults and found similar results. Johnson et al.'s (2009) meta-analysis focused on HIV prevention for African-Americans found similar impact on condom use across the ages studied; yet, adolescents reduced the number of partners they reported whereas adults did not, especially at relatively long intervals after the interventions ended.

Table 3. Meta-analyses focused on health promotion trials gathered by Johnson et al. (2010b).

Behavior	<i>k</i> of studies	<i>M</i> age of sample in years	<i>M d</i> ₊	Homogeneity (<i>I</i> ²)
Abstinence (Silva, 2002)	12	14	0.044 [†]	81.64 [†]
Pregnancy rates (DiCenso, 1995)	30	14.79	0.050 [†]	46.40 [†]
Pregnancy rates, sexual behavior, birth control use (Guyatt et al., 2000)	30	14.82	-0.027	63.99 [†]
Averaged behavioral sexual risk index (Mullen et al., 2002)	2	15	0.25 [†]	0
Condom use (Johnson et al., 2003)	42	15	0.073 [†]	47.33 [†]
Frequency of sexual encounters (Johnson et al., 2003)	38	15.1	0.049 [†]	1.76
Unprotected intercourse (Mullen et al., 2002)	13	15.46	0.19 [†]	70.66 [†]
Number of sexual partners (Mullen et al., 2002)	8	15.75	0.29 [†]	49.53
Sexually transmitted diseases (Mullen et al., 2002)	2	16	-0.11	53.19

Note. Mean effect sizes (*d*₊) are positive for differences that favor health promotion in the treatment group (usually relative to a control group) and are expressed as the standardized mean difference effect size. Homogeneity (*I*²) values may range between 0 (no more than sampling error observed, i.e., homogeneous) and 100 (heterogeneity). [†] *p* < .05.

Johnson et al.'s (2003) sample of HIV prevention trials had greater variability in condom use outcomes than would be expected on the basis of sampling error. Their follow-up analyses with these outcomes revealed that interventions that provided greater amounts of condom skills training (e.g., 60 minutes per session) achieved a moderate effect size ($d = 0.43$). Sheer amount of intervention material did not relate to the success of the trials. For example, intervention success did not improve when more than one session was used. Thus, it appears that mere presentation of information was not sufficient to motivate behavior change; instead inclusion of a skills training component, which was instantiated with activities such as practice with condoms and prostheses, appears to have motivated behavior change. Other meta-analyses more broadly sampling from the HIV prevention literature reach the same conclusion (Albarracín et al., 2003; Smoak et al., 2006): Information alone is insufficient to motivate long-term behavior change, with regard to this health domain at least. Nonetheless, although information itself may not be sufficient to drive behavior change, its presence may well provide message recipients an interpretive context to justify enhancing motivation and behavioral skills to remain safe (e.g., Fisher & Fisher, 1992).

The findings reviewed to this point in this section refer to relatively intensive efforts to reduce risk behaviors, efforts that involved face-to-face communicators, typically with trained facilitators interacting with small groups of participants, using varied intervention tactics and media (mixtures of media presentation, discussion, training sessions). Other literatures show more clearly what kind of success may result from brief presentations that map better on to the persuasion model literature. Often these involve no interpersonal contact whatsoever. To this point, Snyder et al. (2009) reviewed the burgeoning literature on media interventions for HIV prevention, which have appeared around the globe. Their condom use findings suggested that mass media alone have a somewhat smaller (though still significant) effect ($d_+ = 0.22$) than media coupled with interpersonal components ($d_+ \approx 0.28$). Campaigns that continued for very long durations had much larger impact ($d_+ \approx 0.78$). They found no evidence of age effects across the literature, but there were only 3 (3%) studies that focused on samples of adolescents.

Two recent meta-analyses relate well to pure media effects. First, Noar et al. (2007) reviewed the literature on tailoring of health communication messages, which took the form of letters, manuals/booklets, pamphlets/leaflets, newsletters/magazines, or calendars. Overall, tailoring meant a small improvement to message success across the 57 reviewed studies ($d_+ = 0.15$), and no age effects emerged; a large range of ages was present (11.5 to 67.2 years), but the studies predominantly focused on adults (M age = 44.65 years, $SD = 12.20$). Portnoy, Scott-Sheldon, Johnson, and Carey's (2008) meta-analysis trials of computer-delivered messages across multiple health domains, including physical activity, overweight and obesity, tobacco use, substance use, safer sexual behavior, eating disorders, and more general health maintenance, finding that the strategy was successful for most of these behaviors (mean d s varied from 0.01 to 0.35). The studies sampled a wide range of ages (M age=31.05, $SD=14.56$; range=8.28 to 63.00; $k=64$) and age often did relate to the magnitude of effects. In particular, the strategies worked significantly better for younger samples with regard to tobacco use, a relatively small sample of 7 studies (the same pattern showed up, non-significantly, with substance use; other behaviors exhibited homogeneity so no moderation tests were performed). These results are suggestive that pure media effects can be larger than in-person interpersonal interventions and align with Johnson et al.'s (2010b) finding that across health promotion meta-analyses, brief interventions have proven more successful than long, intensive interventions.²

In sum, much evidence across many health behaviors suggests that change is generally more difficult to achieve in adolescents than adults. Unfortunately, extant meta-analyses have focused little on stages of adolescence, which limits the generalizability of the results. Yet, it is known that some methods of influence are more relevant (e.g., computer-based strategies) perhaps because of tailoring and that these combine to increase impact. These encouraging findings are suggestive that adolescents will dedicate significant thought to voluntary media such as they find on the internet. The findings also suggest that adolescents may well often use their defenses against interpersonal influence attempts from organized campaigns, and perhaps especially sexual behaviors. These campaigns appear only to succeed to any large extent when they satisfy an important need, such as to improve condom use skills.

What Elements Do Extant Behavior Change Campaigns Omit?

To develop more successful media campaigns to impact adolescents' health behaviors, one must consider the larger factors that influence their behavior. The emphasis of the paper to this point has been on attitudes because they are the presumed target of media influence attempts, but individual models of behavior incorporate many other variables, such as intentions, self-efficacy (or perceived behavioral control), and, especially important for adolescents, social norms. Ecological models would add interpersonal and structural variables such as parental monitoring, school/teacher connectedness, and community violence or social capital. This review commences with individual perspectives and then moves from interactions with others to even more general influences.

Individual-level variables. An extensive literature has examined individual-level variables in relation to risk behavior, which are arguably the most proximal to behavior (Jaccard, 2009). Of particular note is Albarracín, Kumkale, and Johnson's (2004) meta-analysis of the large literature of studies that examined the variables in the theories of reasoned action (TRA) and planned behavior (TPB) in relation

² Johnson et al.'s (2009) meta-analysis of trials evaluating HIV prevention strategies for African-American showed, intriguingly, that brief interventions exhibited better short-term success that abated over long periods of time but that intensive multiple-session interventions exhibited lower short-term success that actually became more marked over time. Thus, as Johnson et al. (2010) note, brief interventions may be evaluated on relatively short-term outcomes whereas longer interventions tend to take assessments at longer intervals. Meta-analyses to date have tended not to evaluate outcomes in such a nuanced way, suggesting that future efforts in the domains reviewed here will reveal similar patterns.

to condom use (viz., attitude, subjective norm, intention, and for the TPB, perceived behavioral control), including 125 studies generally examining young sexually active adults ($M = 24.90$ years) but also including adolescents (range 14 to 41 years). Age was a large moderator of the relations between the variables specified by the TRA and TPB in three main ways: (1) The relation between perceived behavioral control and behavior and (2) between control and intention was markedly larger for younger than older samples, and (3), importantly, the linkage between intention and future behavior was larger for older rather than younger samples. The implication is that as adolescents develop control over a behavior and as they acquire the necessary cognitive and other resources they can enact safer behavior. Squaring with this conclusion is Albarracín et al.'s finding that intention-behavior relations increased substantially in samples that had completed high school. Similarly, although they did not consider moderation of the variables leading to intention or of attitudes and norms directly to behavior, Hagger et al.'s (2002) meta-analysis of the exercise behavior literature showed a similar pattern: Intention-behavior relations were larger for adults than for adolescents. To be sure, adolescents are still behaving, and often in unhealthy ways, but it is likely that factors other than simple intentions are causally implicated.

Interactions with others. The developers of the TRA and TPB have long maintained that variables other than attitudes, perceived behavioral control, social norms, and intentions have their causal impact through these variables (e.g., Ajzen & Fishbein, 2005), but contemporary social psychological theorizing and much evidence suggests otherwise. Bargh's (e.g., 2006) auto-motive perspective asserts that people develop over-learned tendencies that can be triggered by environmental prompts. Many theorists are concluding that implicit memory traces are laid down through development and set the stage for quick consonant responding throughout life (e.g., Auty & Lewis, 2004; Bargh, 2006; Rudman, 2004). For example, the self-reference effect in memory, whereby items encoded with implications to the self are remembered better than are items otherwise encoded (Rogers, Kuiper, & Kirker, 1977), is twice as large in adults than in children, as Symons and Johnson's (1997) meta-analysis of these studies revealed.

Certainly exposure to media plays a very large role in entraining over-learned tendencies, but direct interactions with others in milieus such as school and family also plays a strong role and can serve as a check on adolescents' risk behavior as well. For example, Li, Stanton, and Feigelman (2000) followed a sample of adolescents over 4 years commencing as pre-adolescents ($M = 11.39$ years, $SD = 1.67$). Adolescents who perceived greater parental monitoring were significantly less likely to engage in the assessed risk behaviors, unprotected sex, drug trafficking, and drug use. Although parents' actual monitoring was not assessed, these results are consistent with a great deal of evidence suggestive that greater parental involvement helps adolescents compensate for the noted deficits in emotional intelligence, self-control, and excessive yielding to peer pressure. In extreme cases of low parental monitoring, extreme risk behaviors may emerge: In 1999, a cluster of syphilis cases emerged in teens living in a prosperous Georgia town. Investigators learned that parental oversight of the teens was lax, permitting them to gather unsupervised and modeled sexual acts that they simultaneously viewed on cable television programs; consonant with the present analysis, the teens were motivated to engage in these acts to gain favor with each other (e.g., Luthar, 2003). Parental monitoring is also considered in the next sub-section.

Consonant with the implications in the bottom row of Table 2, children commence relatively unsophisticated and highly conforming to others in their milieu; it is through their exposure to media, parents, peers, and other community members that they become increasingly sophisticated (e.g., Kotchick, Shaffer, Forehand, & Miller, 2001; Ross & Harradine, 2004). Ironically, the development of over-learned response tendencies that permit us to "gist" message content—in a manner similar to heuristic processing in the HSM—may also imply that younger children are the most rational reasoning

of all (e.g., Rivers, Reyna, & Mills, 2008). The latter pattern is consistent with persuasion models that imply younger audiences should have fewer biases (see Table 2, bottom row).

Finally, considerable evidence suggests that images have a great deal to do with how adolescents behave. Gerrard et al.'s (e.g., 2008) prototype-willingness model specifically focuses on images and theorizes that adolescents will approach images they find favorable and avoid those they find unfavorable. Thus, for example, adolescents (aged 16) who found the image of "drinker" favorable were more likely to intend to drink and to drink two years later (Gerrard et al., 2002). Results such as these suggest that media exposure to positive moderate or low drinking models should enhance the desirability of moderation, and media exposure that casts a negative light on excessive drinking should accomplish the same goal; media messages could also increase drinking behavior by making no, low or moderate drinkers seem negative. (See Blanton & Christie, 2003, for predictions about how these patterns should change depending on whether the target behavior is normative.) It is easy to see how adolescents who wish to engage in a risk behavior will seek to envelop themselves with peers who think similarly and thereby provide a supportive context for engaging in it.

Broader factors. Consistent with the preceding sub-section, social influences on adolescents may be either direct or indirect, injunctive or descriptive, and have been shown to have direct impact on behavior without mediation by conscious variables such as intentions. Indirect normative information former includes relatively passive exposure to information with implications for the risk behavior in question. Examples include such efforts as product placements in films and simple labels and symbols representing products and brandlines. Nike's swoosh has long carried some caché among consumers, especially younger audiences. The candy *Reese's Pieces* became a hit after appearing in the film *E.T.*; Higgins, 1985) and these effects appear more strongly for younger audience members (e.g., Ross & Harradine, 2004). Experimental research also has confirmed these effects. Auty and Lewis (2004) exposed children (aged 6-7) or pre-adolescents (aged 11-12) to scenes from such popular films as *Home Alone* that either contained product placements or did not. Subsequent consumer behavior aligned with these prompts and appeared for both age groups. For such efforts, no words are necessary, and indeed may conflict with the desired intent of the persuader, consistent with social psychological theory relevant to message framing (e.g., Blanton & Christie, 2003). Indeed, warning labels on alcohol appear to lower risk estimates among drinkers, especially when paired with advertising (Snyder & Blood, 1992; Smith, Gerrard, & Gibbons, 1997; for an exception see MacKinnon, Pentz, & Stacy, 1993). Although the mediating mechanism has not yet been identified, it appears that participants strongly counter argue against the warnings when prompted by the advertisements. Indeed, research with emergent adults suggests that using a positive voice in a message boomerangs because message recipients infer from the positive voice praising a desired form of behavior that the targeted behavior is uncommon and therefore are less motivated to yield to the influence attempt (Hall & Blanton, 2009). This research suggests that expertise with relevant norms is a strong factor in media effects.

Norms are but one of the broader variables that merit consideration in a complete analysis of how the media affect adolescents' behavior. Pursuing an ecological approach (Bronfenbrenner, 1979) identifies as important such variables as parental monitoring, familial support, teacher support, community violence, gender roles, race/ethnicity, and socioeconomic status. Voisin et al. (2006) assessed examined such variables among 280 sexually active female adolescents (aged 14-18, $M = 15.3$ years) detained in 8 facilities in Georgia (U.S.). Behaviors that put the adolescents at risk for STDs (e.g., unprotected intercourse, sex trading) were a function not just of individual-level variables including risk-taking attitudes and substance use but also were more likely to occur if the adolescents had poor parental monitoring, lower familial support, perceived that their peers supported these behaviors, experienced low connectedness with their teachers, and perceived that gender roles were male-

dominated. Indeed, the latter variables had more collective impact than did the individual-level variables.³ This particular study found no relation of media exposure (the number of X-rated films they had seen in the preceding 2 months) to behavior when controlling for the preceding factors. Community-level interventions that have intervened to improve parental environments have often seen parallel safer behavior in affected adolescents (e.g., Holder et al., 2000) as have community interventions with school-based components (e.g., K. Johnson et al., 2007; Kirby et al., 1994; K. Li et al., in press).

Reviews of studies that examine broader variables have concluded that these factors often play large roles in adolescents' behavior (DiClemente, Salazar, & Crosby, 2007; Hovell et al., 1994; Kotchick et al., 2001). It is easy to see how elements in the adolescents' environments may impede or facilitate any media influence effort. These environmental factors are probably best seen as moderators of media effects than as direct causes of behavior. For example, neighborhood risk appears to moderate the link between willingness to engage in risk behavior and the behavior itself, with the willingness-behavior link being much stronger in high-risk than low-risk neighborhoods (e.g., Gibbons et al., 2004). The Georgian teens at the center of the syphilis outbreak described in the previous section had willingness to engage in the risky acts and a milieu that facilitated it, such as parental affluence that enabled the presence of cable television programming, lax parental monitoring. The parents may also have placed excessive trust in their teen children, treating them more like adults than children (Luthar, 2003).

In addition to all these social and contextual variables that encapsulate adolescents (not to mention adults), a further consideration is the extreme media saturation in which persuasive appeals often appear. Not only do advertisements appear in an increasingly dense array but also a social marketing appeal to change behaviors and reduce a health risk may encounter an overwhelming number of messages urging the opposite behavior. For example, until the FDA banned tobacco advertising, media efforts to halt initiation of smoking or to stop smoking faced a juggernaut of advertising promoting smoking. Moreover, such efforts were designed with addiction-ready teens in mind. Nonetheless, positive change is still possible, with sufficient resources: The 1998 Florida "truth" campaign lowered rates of smoking initiation in adolescents in those who were exposed to the media campaign (Sly et al., 2001).

Hovell et al.'s model (Figure 1) illustrates the bewildering number of factors that may interplay in adolescents' sexual risk behavior. What is perhaps not especially clear from this model are implications for developmental stage: What sorts of messages should be delivered to an early vs. middle vs. late adolescent? The answer to this question would appear to depend on the nature of the health problem and the epidemics in question, because it is clear that early-commencing risk behaviors are continued and often augmented throughout adolescence and into adulthood. If it is nutrition, physical activity, obesity, or smoking, then clearly even pre-adolescent children and their parents should be targeted. If it is sexual or substance-use behavior, then early or middle adolescence are indicated.

Thus, media strategy needs to consider the nature of epidemics, which often co-occur, a phenomenon that Singer (1994, 2009) termed *syndemics*. For example, people living with HIV tend to be smokers and experience higher rates of cancer than people who are HIV negative. Obese individuals are more likely to have diabetes. People with unsafe sexual behaviors as adolescents still exhibit these

³ Although this finding would appear to contradict Ajzen and Fishbein's (2005) assertions that the individual-level variables attitudes, subjective norm, perceived behavioral control, and intention mediate broader influences, it should be noted that (a) Voisin et al.'s (2006) research was retrospective rather than prospective; (b) attitudes and intentions may change between an assessment and the measures of behavior; and (c) the research in question also did not assess perceived control or intentions.

patterns as adults. All of these problems have their roots in or even before adolescent years (Donovan & Jessor, 1985; Jaccard & Blanton, 2005). Indeed, there is some evidence that behaviors exhibited in very young childhood are related to those in adulthood: Stevenson and Goodman (2001) used a longitudinal epidemiological dataset to determine that such behaviors as daytime enuresis, temper tantrums, and non-compliance with directives, all assessed at age 3, were associated with adult convictions, especially violent offenses.

Because it is possible to identify individuals at elevated risk for particular health behaviors, more efficient targeting of media becomes possible. Of particular note is research on young men who have sex with men (MSM), who comprise a significant portion of the HIV incidence in the U.S. and elsewhere. The factors that help to put MSM at elevated risk for HIV can be traced to adolescence. In many communities, people have less freedom to be open about a sexual orientation that is deviant from the majority due to justifiable fears of isolation, discrimination, and victimization. Such social adversity has been linked to a syndemic of health issues including HIV (Meyer, 2003; Mustanski et al., 2007; Stall et al., 2003). Controlling for age, education, race, income, HIV status and sexual risk, urban MSM are nearly twice as likely as non-MSM to have experienced childhood sexual abuse (Paul et al., 2001). Patterns of substance abuse emerge during adolescence, with lesbian, gay and bisexual (LGB) youth being nearly 3 times more likely to be substance users (Marshal et al., 2008). Scholars identify victimization by non-LGB peers as pushing LGB teens into groups that then support each other. Substance use becomes a way of coping with their stigma. Media strategies attempting to change risk behaviors of young LGBs would seem to face significant resistance without simultaneously improving the social standing of such people in their communities. Stigmatized individuals have strong ties to their groups and the groups normatively exhibit risky behaviors; one may regard them as having value-relevant involvement with these behaviors, relatively strong attitudes that are difficult to change (Table 2, bottom row). To date, unfortunately, no interventions have coupled health promotion interventions for a particular target group, such as teen LGBs or MSM, while simultaneously campaigning more broadly with their peers to reduce stigma related to the target group.

Finally, the nature of behavior change desired deserves some consideration. The individually-focused models such as appeared in the first half of this paper are at their best when targeting specific risk behaviors. Their use dictates focusing carefully on the beliefs necessary to impact to effect attitude change (e.g., Fishbein & Ajzen, 1981). Yet, a consideration of the broader perspectives from this section casts dispersions on the extent to which interventions might change adolescents' health behaviors without also ensuring that the milieus in which adolescents move are aligned to maintain the safe behavior changes (Johnson, Redding et al., 2010a). Without supportive milieus, any risk behavior changes that individually-focused interventions might achieve would seem doomed to failure as the adolescents encounter and bow to pressure from peers who were not persuaded or who never received the intervention in the first place. In parallel, other milieus such as the family can play an important role in sustaining changes from interventions—or in undermining them. Parents who exhibit the same unsafe behaviors that interventions try to thwart in their adolescent children face an uphill battle for success. The implication is that specific behavior change is an ideal that to be achieved must be coupled with changes at broader levels, which also might entail broader behavior goals (Johnson, Redding et al., 2010a).

Encouragingly, evidence suggests that early interventions with pre-adolescents to create positive life skills can ameliorate or overcome such possible negative cycles. Two controlled trials will illustrate what is possible. First, Flay and colleagues (2004) reduced high-risk behaviors among inner-city African American youth in grades 5 through 8 by using a social development curriculum coupled with broader school, parental, and community components. Effects at the 4-year assessment were especially

prominent for boys but not for girls. Second, even more dramatic are the impacts that Hawkins and colleagues (1999) documented in their intervention conducted in the mid 1990s in 15 Seattle elementary schools. They were provided a series of skills-building activities sequentially across grades 1 through 6. Targets were teachers (for effective classroom management), parents (behavior managements skills, academic support, and drug prevention), and the children themselves (interpersonal problem-solving and refusal skills). Compared to controls, intervention participants exhibited significantly better mental and sexual health 15 years later (age 27) as well as better socioeconomic attainment (Hawkins et al., 2008), and the patterns attained for both genders. Such patterns are consistent with the concept of adolescent resiliency in the face of opposing forces (Olsson, Bond, Burns, & Vella, 2003). Although such patterns represent relatively small effect sizes, the fact that they could be present even 15 years after ceasing the intervention activities is notable indeed. The current analysis suggests that were such a program standard across the broader region, its effects would be even more marked.

Conclusion

Because attitudes can be changed directly by media approaches, they are a popular target of social marketers who target portions of the population in segmentation strategies. Segmentation is useful when a certain message has greater relevance to a target population; thus, when individuals in that population have a need that the message promises to fill, then attention to the message increases along with heightened processing of the message. Persuasion theories represent relatively sophisticated perspectives on how to gain influence, but they do not consider all the necessary variables if large health behavior change is the goal, and they have not been evaluated thoroughly with adolescent target audiences. Moreover, they are currently relatively unsophisticated about developmental factors. Lessons learned from applied research on adolescents helps to identify the barriers that must be overcome to achieve large behavior change, including the factors that anchor adolescents' attitudes and make them resistant to change and the traditional and contemporary media channels that adolescents increasingly have to interact with their peers. Intensive health promotion campaigns can succeed in making adolescents' health behaviors safer, but generally these have been campaigns that dedicated significant time to improving adolescents' behavioral skills and to make the desired, health promoting behaviors appear acceptable. Health promotion efforts with adolescents and children should continue to be the focus of new research, in an effort to unify an understanding of the early-life patterns that reduce health and shorten or reduce the quality of adult lives.

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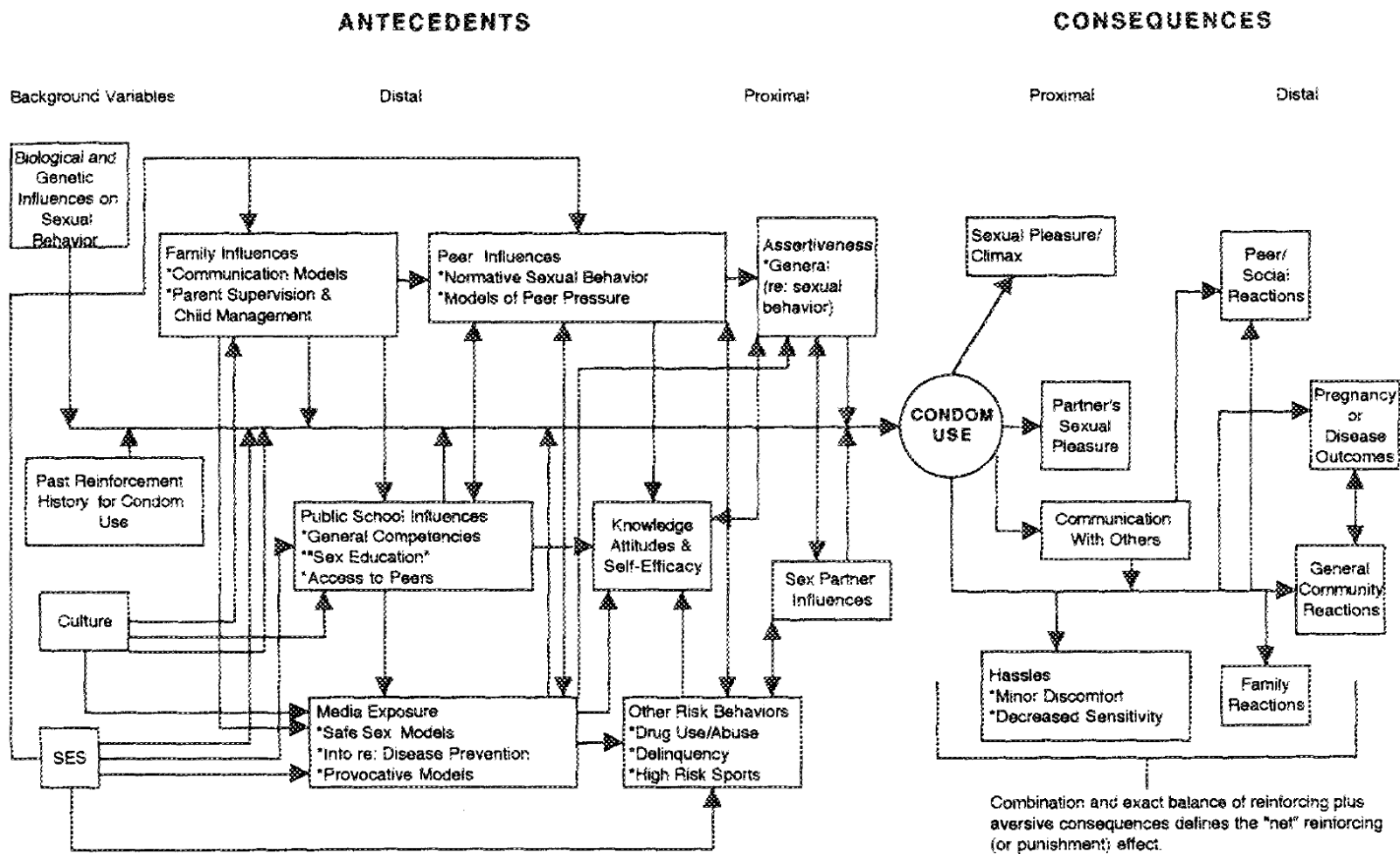
Table 1. Comparison of four contemporary process models of persuasion along key conceptual dimensions. (Adapted from Johnson, Maio, & Smith-McLallen, 2005.)

Conceptual Dimension	Models of Persuasion			
	Elaboration Likelihood Model (ELM)	Heuristic Systematic Model (HSM)	Unimodel	Cognition in Persuasion Model (CPM)
Number of qualitatively distinct general processing modes	Two, central and peripheral routes (the latter has several processes)	Two, heuristic and systematic processing	One, epistemic thought	One with stages (identification, interpretation, selection)
Use of reception vs. yielding processes	Primarily focused on variables that moderate yielding	Primarily focused on variables that moderate yielding	Prior knowledge and selective attention impact reception; depth of information processing affects yielding	Specifies cognitive processes involved in both reception and yielding
When motivation and ability to process information are high	Processed via central route	Systematic processing	Increased epistemic thinking	Message content more important
When motivation and ability to process information are moderate	Generally not discussed (predicted effects implied as monotonic)	Not discussed	Not discussed because predicted effects are monotonic	Extra-message factors are identified but not discounted and thus have an influence
When motivation and ability to process information are low	Use of any of several peripheral route processes	Heuristic processing	Decreased epistemic thinking	Decreased identification of message-content and of subjectively less relevant factors
Effect of argument quality on attitude change	Processed via central route, increases monotonically with ability and motivation to process messages	Processed systematically, increases monotonically with ability and motivation to process messages but may interact with heuristics	Increases monotonically with ability and motivation to process messages	Increases monotonically for strong but not weak arguments as motivation and ability increase; for weak arguments, curvilinear under moderate levels
Effect of recipient mood	Positive moods increase reliance on peripheral cues under moderate ability and motivation but can be used as information or bias processing under high and low ability	Positive moods generally associated with increased reliance on heuristics but mood itself can be used as a source of information	Mood can be used as relevant information in some instances, increasing monotonically when mood-inducing stimuli require ability and motivation	Mood should affect attitude under moderate ability and motivation but have less influence otherwise
Behavior elicited in favor of message	More likely following strong arguments and unbiased use of the central route	More likely following strong arguments processed systematically under an accuracy motive	More likely following extensive epistemic thought of information implying truth value	More likely following strong arguments when temporally near the behavior point

Table 2. Implications of persuasion models at different developmental stages.

Models of Persuasion	Developmental stage		
	Pre-adolescent children	Early to middle adolescents	Late adolescents
Information Processing Model	Reception processes are rudimentary, yielding easy	Development of reception and yielding processes; moderate reception and yielding ability	Reception processes are highly developed and yielding is resistant
Elaboration Likelihood Model (ELM)	Least potential for elaboration, larger peripheral cue effects; less bias from prior experience	Larger peripheral cue effects than central cue effects	Highest potential for elaboration, larger argument quality effects, but most biased from past experience
Heuristic Systematic Model (HSM)	Development of heuristics and rudiments of systematic thinking	Processing emphasizes impression formation and maintenance	Impressions still important, but attitudes solidify and are more often defended against media influence attempts
Unimodel	Epistemic thought is rudimentary	Development and selective deployment of epistemic thinking	Epistemic thought is sophisticated
Cognition in Persuasion Model (CPM)	Lack differentiated presentations of messages and conditions surrounding messages	Extra-message factors are increasingly identified but usually not discounted and thus have an influence	Extra-message factors may be identified and discounted and thus have less influence
General implications	Emotional and other nonverbal cues are powerful relative to information. Attitudes and acquired habits related to behavior are weak. Skepticism is rare.	Emotional cues decrease slightly in power and information cues become more powerful. Information processing is driven by impression motives. Attitudes become stronger and habits accrue.	Emotional cues remain important, but information can overwhelm them. Attitudes are often strong and can be defended. Skepticism is common.

Figure 1. Hovell et al.'s (1994) behavioral-ecological model of adolescent condom use.



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