

DISTRACTION DURING PERSUASIVE COMMUNICATION: A META-ANALYTIC REVIEW

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Research on the effect of distraction has produced conflicting results and competing theoretical explanations. Nonetheless, distraction has been cited as the process by which violations of conversational expectations influence the outcomes of persuasive communications. In this study, results from 38 studies examining distraction were subjected to meta-analysis. The results indicate it is necessary to distinguish between communication relevant distraction (produced by behaviors of the source) and communication irrelevant distractors. The former, including violations of conversational expectations, produce attitude change via source valence effects, while the latter, in general, reduce attitude change by reducing message comprehension. The counterarguing hypothesis receives little support, though questions concerning counterargument measures suggest that it may not have been put to a fair test. The type of communication irrelevant distraction influences the reduction in attitude change perhaps due to the cognitive load required to overcome the distraction. Overall, the effect of communication irrelevant distraction on attitude change is moderate at best.

INTEREST in the effects of various environmental factors on the efficacy of persuasive messages has existed in communication and social psychology for many years. One of these factors that has stimulated much thought and research is distracting stimuli within the communication situation. By and large, the results of these efforts have produced contradictory theoretical explanations and research findings. Nonetheless, recent theories regarding violations of expectations have invoked several of these explanations to account for the persuasive effects of violations. These explanations, however, must be considered with caution given the less than clear findings in the area of distraction. The current study reports results of a meta-analytic review of past studies on distraction, which clarifies the effects of distraction on counterarguing, message comprehension, and source derogation. To place the meta-analysis in theoretical context explanations for the effects of distraction involving counterarguing, favorable thought production, message comprehension, and evaluation set will be examined.

The seminal research in the area of distraction was performed by Festinger and Maccoby (1964), who demonstrated that in some conditions the presence of an irrelevant distractor enhanced attitude change after a persuasive message. They hypothesized that distraction disrupted cognitive defenses in the form of counterarguing, rendering the receivers more susceptible to the persuasive attack.

Other researchers quickly reexamined this relationship and Festinger and Maccoby's rationale. Some have reported similar results, while others have shown that distraction can reduce attitude change. These contradictory findings have led researchers to offer alternative explanations for the effects, test other variables that might act as mediators, and speculate on the limited impact of distraction on attitude change. The eight alternative explanations are: counterargument disruption, domi-

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nant thought disruption, learning theory, nonmonotonic relationship, evaluation set, listener focus, effort justification, affect reaction, and evaluation apprehension/demand characteristics. All of these explanations have some measure of support by at least one study; however, the counterarguing hypothesis and the learning theory explanations have received the most attention.

This confused state of affairs has rendered the findings less useful and may have contributed to the decline in interest and research on distraction in the past decade. Any researcher desiring to employ distraction as an explanatory variable must contend with being unsure whether it consistently yields more or less attitude change and what cognitive processes play a role in this outcome. This has not, however, entirely prohibited the use of these findings.

Recently, theories concerning the effects of violations of expectations on attitude change have invoked several distraction explanations to account for the effects of violations. The two lines of violations research that have used the distraction explanations are language intensity expectations (Burgoon, Cohen, Miller & Montgomery, 1978; Miller & Burgoon, 1979) and nonverbal expectations of proxemic behavior (Burgoon, 1983; Burgoon, Stacks & Burch, 1982; Stacks & Burgoon, 1981) and kinesic synchrony (Woodall & Burgoon, 1981). These two lines of expectancy research have used the counterarguing hypothesis, learning theory (both involving message comprehension), and evaluation set (related to source derogation) as explanations for the effects of the violations accompanying persuasive communications.

REVIEW OF PAST RESEARCH

Counterargument Disruption

As already noted, the first direct examination of the effects of distraction was performed by Festinger and Maccoby (1964). In a reexamination of an earlier study by Allyn and Festinger (1961), where more attitude change occurred among non-forewarned subjects instructed to focus on the personality of the speaker rather than the message, Festinger and Maccoby speculated that the enhanced persuasive effect may have been due to the distraction of focusing on the speaker's personality. They theorized that in a persuasive situation, a receiver subvocally counterargues the message. The more counterarguments produced, the more resistance he or she demonstrates. Hence a variable that disrupts this counterarguing should result in more attitude change. They hypothesized that personality focus distraction produced such a decrement in counterarguing. To test this hypothesis, Festinger and Maccoby had students listen to a persuasive speech advocating the abolition of college fraternities while watching either a film of the speaker delivering the speech or an irrelevant animated movie. The results showed an increase in attitude change for a group of fraternity members seeing the irrelevant film, which was interpreted as support for the counterargument disruption hypothesis.

Many researchers have subsequently attempted to support or refute this hypothesis, with mixed results. Freedman and Sears (1965), replicating the Allyn and Festinger personality focus manipulation, observed trends in the direction predicted by Festinger and Maccoby. Other studies supporting this hypothesis include Rosenblatt (1966), Vohs and Garrett (1968), Shamo and Meador (1969), Kiesler and Mathog (1968), Zimbardo and Ebbesen (1970), Osterhouse and Brock (1970), Zimbardo, Snyder, Thomas, Gold, and Gurwitz (1970), Insko, Turnbull, and

Yandell (1974), Keating and Brock (1974), Haslett (1976), Burgoon et al. (1978), Watts and Holt (1979), Brandt (1979), and Burgoon et al. (1981).

Numerous problems and qualifications beset the validity of this supporting data. First and probably most important, many of the studies listed above failed to directly measure counterarguing. Rather, authors observing increased attitude change under distracting conditions have merely assumed that counterargument disruption was the most plausible mediating variable. Studies prior to 1970 did not measure counterarguing. Beginning with Zimbardo and Ebbesen (1970) and Osterhouse and Brock (1970), counterargument production has been measured, though not in all cases (Brandt, 1979; Burgoon et al., 1978; Burgoon et al., 1981; Watts & Holt, 1979). Further, many reviewers have chosen to list any study that reports an increase in attitude change given distraction as support for the counterargument disruption hypothesis. This seems to be a faulty assumption. Many alternative explanations, including the evaluation set explanation to be discussed later,¹ predict a facilitative effect of distraction based upon distinctly different cognitive processes.

Generally, the results of studies where counterarguing has been measured show that increasing distraction decreases counterarguing. This finding is not, however, sufficient justification for the defensive function of counterarguing (Baron, Baron & Miller, 1973; Miller & Baron, 1973). The validity of the counterarguing measures has been criticized. In most cases, measures are taken after assessments of attitude change; hence, it is unclear whether counterarguing is a cause of the final attitude or the product of it (Miller & Baron, 1973). Romer (1979) suggests that the counterargument measure developed by Brock (Osterhouse & Brock, 1970) is a measure of actual attitude change rather than cognitions during persuasion. Romer and Miller and Baron also argue that the counterarguing measures may produce a demand effect, with persons feeling compelled to demonstrate their commitment to their new attitude by listing less counterarguments.

Miller and Baron also take issue with the definitions of counterarguments prevalent in the research literature. They suggest that these definitions may be too narrow, limiting counterarguments only to direct refutations of the validity of the persuasive arguments. In addition, they question the utility of the assumption that source derogation is an alternative to counterarguing and speculate that these two processes may be causally linked.

The correlations reported between counterarguing and final attitude change are also cause for concern. Few studies have actually estimated this effect, and the two that have provide conflicting results. In the first case, Zimbardo et al. (1970) found counterarguing was uncorrelated with final attitude, while in the second, Insko et al. (1974) demonstrated that the relationship between distraction and attitude change disappeared when counterarguing was covaried out of the analysis.

These problems, however, are not so fatal as to falsify the counterargument disruption hypothesis. As Baron et al. (1973) point out, this theory appears to explain many of the results observed across studies. Further, the theory appears to be robust, in that distraction effects on counterarguing and attitude change have appeared across a variety of topics, speakers, and situations.

Only a few conditions or factors have surfaced to mitigate this counterarguing effect. Festinger and Maccoby point out that a distractor should not be so strong as to inhibit reception of the message (a point discussed in the Learning Theory section). Second, this hypothesis appears only to explain effects for counterattitudinal messages (see section on Dominant Thought Disruption). Third, the type and

complexity of the distractor may be important. Osterhouse and Brock (1970) and Keating and Brock (1974) suggest that a vocal distractor should be better able to disrupt counterarguing, though Haslett (1976) found no support for this—but, visual distraction did appear to be less powerful than vocal or manual. Moreover, Baron et al. suggest that distractions focusing attention on the speaker's personality may operate according to a strict credibility effect (see discussion of Evaluation Set). Finally, Brandt (1979) provides evidence that a receiver's propensity to counterargue may affect distraction, such that receivers with a high propensity to counterargue can overcome the distraction and be less persuaded than those with a low propensity to counterargue.

Dominant Thought Disruption

The most recent theory of the effects of distraction is the dominant thought disruption hypothesis (Petty, Wells & Brock, 1976). An extension of the counterarguing explanation, this hypothesis posits that distraction disrupts cognitive processing of which counterarguing is only one form. Further, this disruption reduces the most dominant (plentiful) thoughts during message reception. In this form, the hypothesis can predict reaction to both pro and con messages. When hearing a proattitudinal message, a receiver is likely to engage in many more favorable thoughts than counterarguments. The favorable thoughts are considered the dominant thought and are most susceptible to influence by distraction. Specifically, distraction works to reduce the number of favorable thoughts without affecting the number of counterarguments, leading to less attitude change. Conversely, when receiving a counterattitudinal message, the receiver produces more counterarguments than favorable thoughts. Distraction in this case reduces the number of counterarguments without affecting favorable thoughts, leading to more attitude change. Petty et al. provide evidence from two experiments that supports this formulation.

Insko et al. (1974) also report confirmation of the effects of distraction on both counterargument and favorable thought production. Further support for the dominant thought production hypothesis is provided by Lammers and Becker (1980), who showed that distraction reduced counterargument disruption when a counterattitudinal message was presented and decreased favorable thought production when a proattitudinal message was presented. Lammers and Becker, however, did not find any effect of these changes in cognitive processing on attitude change, though they did conclude that the data supported Petty et al.'s dominant thought disruption formulation.

Recently, Harkins and Petty (1981) expanded the dominant thought disruption hypothesis to include information processing in general. They theorized that the effects of distraction should be more pronounced in maximum information processing situations. Using conditions varying the number of sources and the number of arguments, Harkins and Petty showed that the decrement in attitude change observed when three sources each presented a unique argument was greater than in conditions where multiple sources presented a single argument or multiple arguments were presented by a single source. (Previous research had shown that the multiple source/multiple argument condition produced more information processing and opinion change than the other two conditions when distraction was not present.) Harkins and Petty offer this as further evidence that distraction disrupts the

dominant thought patterns existing during persuasion. They do, however, point out that distraction does not disrupt all cognitive processing, since some attitude change occurred in all conditions.

Learning Theory

In opposition to the counterarguing and dominant thought disruption explanations are a group of studies showing that attitude change decreases when distractors are present during the message. The major explanation for these findings involves learning theory. Shortly after Festinger and Maccoby's report, McGuire (1966) briefly observed that their results were inconsistent with learning theory. He suggested that distraction should interfere with message comprehension, and this failure to learn, not the defensive mechanisms, should affect attitude change by reducing it (McGuire, 1969).

The inhibitory effects of distraction on message comprehension and attitude change have been demonstrated in a number of studies, including many which support other explanations. Specific to the learning theory explanation, Silverman and Regula (1968), Vohs and Garrett (1968), Haaland and Venkatesen (1968), Burgoon, Fraedrich and Bachman (1979), and Romer (1979) offer data supporting McGuire's contentions.

There is cause to question this as a robust explanation of the effect of distraction. Specifically, it appears that, to affect attitude change, the reduction in learning must be large. In fact, many studies that show increased attitude change in the presence of distraction show decreased message comprehension (Insko et al., 1974; Rule & Rehill, 1970; Zimbardo et al., 1970). As Baron et al. (1973) point out, Festinger and Maccoby, when originally presenting the counterargument disruption hypothesis, noted that the distraction should not be so great as to severely reduce message comprehension. Insko et al. go further, positing that the relationship between message comprehension and attitude change is very flat. Thus, a significant change in message comprehension does not necessarily translate into a reduction in attitude change. Rather, it requires a very large reduction in message comprehension to reduce attitude change significantly. Unfortunately, neither Insko et al. nor Zimbardo et al. report correlations between recall and final attitude.

Nonmonotonic Relationship

Another explanation related to McGuire's (1966, 1969) learning theory explanation posits a nonmonotonic relationship between the intensity of distraction and attitude change. Vohs and Garrett (1968) proposed that distraction functions much like a personality variable in McGuire's two-stage mediation theory: Low to moderate levels of distraction increase yielding through counterargument disruption, while moderate to high levels of distraction decrease yielding through comprehension reduction.

Cumulative results provide only minimal support for this explanation, often in the form of trends. Specifically, Rosenblatt (1966) reported an increase in attitude change for moderate distraction and a trend toward less attitude change for high distraction. Vohs and Garrett found increased attitude change at all levels of distraction. Regan and Cheng (1973) reported that distraction increased attitude change for an easy-to-understand but unconvincing message due to reductions in counterarguing, while distraction decreased attitude change for a difficult-to-

understand but convincing message due to reductions in comprehension. (This also appears consistent with the dominant thought disruption hypothesis.) Haslett (1976) presented slight evidence for the nonmonotonic relationship, but the findings were nonsignificant. Romer (1979) reported a nonmonotonic relationship between counterarguing and distraction.

In general, the data are unconvincing; however, some researchers appear to accept implicitly such a nonmonotonic relationship. Often, a reduction in attitude change under distracting conditions is explained by assuming the distraction was more intense than in other studies, leading to less comprehension (cf., Baron et al., 1973; Burgoon et al., 1979). Also, many authors realize that at some point the distractor can cause the message not to be received at all. Thus, it appears that, while the data are weak, there is some belief in the presence of this nonmonotonic relationship.

Evaluation Set

The fifth set of explanations involves source derogation, or less generally, source evaluations by the receivers faced with distraction. Since the original study by Allyn and Festinger (1961), researchers have assumed that setting a receiver to focus on the personality of the speaker is a distracting task, producing more yielding (see also Freedman & Sears, 1965). Miller and Baron (1967) and Baron et al. (1973) suggest, however, that this enhancing effect is not due to the distraction-induced disruption of counterarguing; rather, it is due to credibility evaluations. Specifically, Miller and Baron and Burgoon et al. (1978), working with language intensity, provide evidence that setting the receiver to focus on a high-credible speaker increases attitude change, while setting the receiver to focus on a low-credible speaker reduces attitude change.

Recent research on the distracting effects of violations of nonverbal expectations also yields this credibility effect (Burgoon et al., 1982; Stacks & Burgoon, 1981; Woodall & Burgoon, 1981). Violations of proxemic norms by a rewarding persuader increase ratings of credibility and attitude change (Burgoon et al., 1982). Woodall and Burgoon (1981) found that dissynchronous kinesic cues produce more source derogation, less message comprehension, no difference in counterarguing, and less attitude change. As the authors admit, the effects of credibility and counterargument disruption are not tested by these data, though they offer them as explanations for the results.

Taken together, the findings suggest that distractions that focus attention on the speaker may influence source valence perceptions rather than counterarguing or message comprehension. These perceptions seem to produce attitude change effects different from changes produced by non-source centered distractors.

Listener Focus

Tangential support for the evaluation set explanation comes from an explanation offered by Zimbardo et al. (1970) concerning the degree to which the listener focuses on distractors as opposed to the message. They speculate that a receiver faced with a distracting stimulus must choose between focusing on the message or the distracting stimulus. In the presence of distraction, focus on the message content will increase attitude change due to disruption of counterarguing, while focus on the distracting task/stimulus will reduce attitude change due to reduction in message comprehension. Zimbardo et al. present evidence that confirms these predictions in two of three

experiments. Further, they report that attention, learning, and counterarguing are all related to the listener's focus, but only focus is related to final attitude. They suggest that these mediators may be independent of attitude change, though influenced by the focus of the listener.

Insko et al. (1974) replicated Zimbardo et al.'s results but did not find a mediating relationship between thought production (both counterarguments and favorable thoughts) and attitude change. Further, they showed that covarying counterarguments or favorable thoughts caused the relationship between message focus and attitude change to disappear. They also found that effort was important in mediating the effect of task focus on attitude change; however, they failed to show that recall affected final attitude in the task focus condition.

Keating and Brock (1974) question the utility of the listener focus effect in understanding the effects of distraction because a distraction, by definition, cannot be the center of a listener's attention. However, the findings concerning the evaluation set explanation suggest that listener focus is critical when the source of the distraction is the communicator delivering the persuasive message. Such is the case in the violations of expectations models. In these models, though, focus on the distractor does not always result in less attitude change (as claimed by Zimbardo et al.) but seems to be determined by the credibility of the communicator (distractor). In addition, Burgoon et al. (1978) have shown that the focus of the receiver on either the message or the source influenced attitude change following a second message, supposedly by reducing counterarguing during the first message.

Conclusions

Clearly, the literature on the effects of distraction contains a variety of competing theoretical explanations and empirical findings. Some explanations are more firmly supported than others (Baron et al., 1973), such as counterargument disruption and learning theory; however, no one explanation accounts completely for the entire data base. This makes one cautious when accepting distraction-based explanations of the persuasive effects of violations of expectations. A close examination of this data base is warranted before fully accepting these explanations.

Meta-analytic techniques for integrating findings from a series of experiments examining the same theoretical constructs seem especially well suited for completing such a comprehensive analysis of the distraction literature. Meta-analysis, with its grounding in sampling statistics and ability to take into account statistical power, can estimate true effects across a group of studies and identify those mediators of statistical importance, which reviews based on simple counts of significant relationships cannot accomplish.

META-ANALYSIS

Sample

A thorough search of the research literature examining distracting stimuli was conducted. Two criteria were developed to determine whether a study would be included: (1) the major purpose of the study must have been to examine the relationship between distracting cues and attitude change following a persuasive message, and (2) the study had to include the experimental manipulation of a distracting cue during the presentation of a persuasive message. Two exceptions were made. Studies examining violations of expectations were included, even though

they did not have the a priori purpose of examining the relationship between distraction and attitude change. The interest in the utility of the distraction explanations in the violations model required that the data from these studies be incorporated to see if they were consistent with data from distraction studies. A study by Janis, Kaye, and Kirschner (1965) on the effects of eating during a persuasive message was also included, since it is often mentioned by researchers in the area as a study whose findings could be accounted for by distraction explanations.

Two search methods were used. A manual search of literature prior to 1973 was guided by Baron et al.'s (1973) comprehensive review. A computer search was also performed of literature after 1970. In addition, reference sections of articles satisfying the above criteria aided in the literature search.

Thirty-eight studies were initially identified by the manual and computer searches. Of these, seven were judged unusable due to unavailability, lack of persuasive communication, or lack of summary data.² Thirty-one studies were included in the meta-analysis, yielding 41 experimental manipulations of distraction (Table 1).

TABLE 1
ESTIMATES OBTAINED FROM STUDIES INCLUDED IN THE META-ANALYSIS

	Attitude Change	Counter- arguing	Message Comprehension	Favorable Thoughts	Source Derogation
Allyn & Festinger (1961)	X				X
Festinger & Maccoby (1964)	X				X
Vohs (1964)			X		
Janis, Kaye & Kirschner (1965)	X				
Freedman & Sears (1965)	X				
Zimbardo (1965)	X				
Rosenblatt (1966)	X				
Miller & Levy (1967)	X				X
Silverman & Regula (1968)	X				
Vohs & Garrett (1968)	X				
Haaland & Venkatesen (1968)	X				X
Kiesler & Mathog (1968)	X				
Shamo & Meador (1969)	X		X		
Rule & Rehill (1970)	X		X		
Zimbardo, Snyder, Thomas, Gold & Gurwitz (1970)	X	X	X		
Osterhouse & Brock (1970)	X	X	X		
Zimbardo & Ebbesen (1970)	X				
Regan & Cheng (1973)	X		X		
Keating & Brock (1974)	X	X	X		
Insko, Turnbull & Yandell (1974)	X	X	X	X	
Haslett (1976)	X	X	X		
Petty, Wells & Brock (1976)	X	X	X	X	
Burgoon, Cohen, Miller & Mont- gomery (1978)	X				
Brandt (1979)	X				
Watts & Holt (1979)			X		
Romer (1979)	X	X	X		
Burgoon, Fraedrich & Bachman (1979)	X				
Harkins & Petty (1981)	X		X	X	
Woodall & Burgoon (1981)	X	X	X		X
Stacks & Burgoon (1981)	X				
Burgoon, Stacks & Burch (1982)	X				

Meta-Analysis Procedures

The technique of meta-analysis employed was a combination of procedures recommended by Glass, McGaw, and Smith (1981) and Hunter, Schmidt, and Jackson (1982). The procedure involved converting available summary statistics (in the form of means, standard deviations, correlations, F-statistics and sums of squares or mean squares) to standardized effect size estimates (d). The effect size estimates were then converted to correlational estimates for the purposes of summary.

Correlations are more useful because they provide estimates of both the size and direction of the relationships of interest. Hunter et al. provide procedures to correct correlations for measurement error (unreliability and range restriction) and examine methodological characteristics affecting the relationship.

After calculation of correlations from each study, a sample size weighted average correlation was determined. This average correlation is considered an estimate of the true relationship between two variables, since it is the average of the sampling distribution as opposed to the sample distribution in a single study. Using procedures suggested by Hunter et al., the sampling error was removed from the variance in this average correlation. The remaining observed variance was then compared to the amount of variance in the average correlation expected by chance, using a chi-square test. If the chi-square test was nonsignificant, the variance was considered trivial and the average correlation was assumed to be an accurate true score estimate. If the chi-square test was significant, the observed variance was considered nontrivial and alternative methods of examining average correlations were undertaken.³

One of the methods Hunter et al. suggest for further exploring unstable average correlations is subset analysis. In essence, subset analysis is a series of smaller meta-analyses, where estimates are separated into smaller groups based on the presence or absence of some methodological characteristic thought to account for a portion of the nontrivial variance. In the current analysis, subset analysis proved very useful in sorting out the effects of distraction on counterarguing, message comprehension, and source derogation.

Observed Relationships

Given the interest in counterargument and dominant thought disruption, learning theory, and evaluation set explanations for the effect of distraction, average correlations were calculated for relationships central to these explanations. These included the relationships between distraction and attitude change, counterarguing, favorable thought production, message comprehension, and source derogation. In addition, correlations between attitude change and counterarguing, message comprehension, and source derogation were also calculated where possible. Table 1 lists the type of relationships for which estimates were obtained from each experiment included in the meta-analysis.

Analysis

Figure 1 details the progression of analyses. First, an overall analysis was performed, yielding few stable relationships. Next, a scatterplot of correlations of distraction with attitude change by correlations of distraction with message comprehension was examined for evidence of a nonmonotonic relationship between distraction and attitude change mediated by message comprehension. Subset analyses

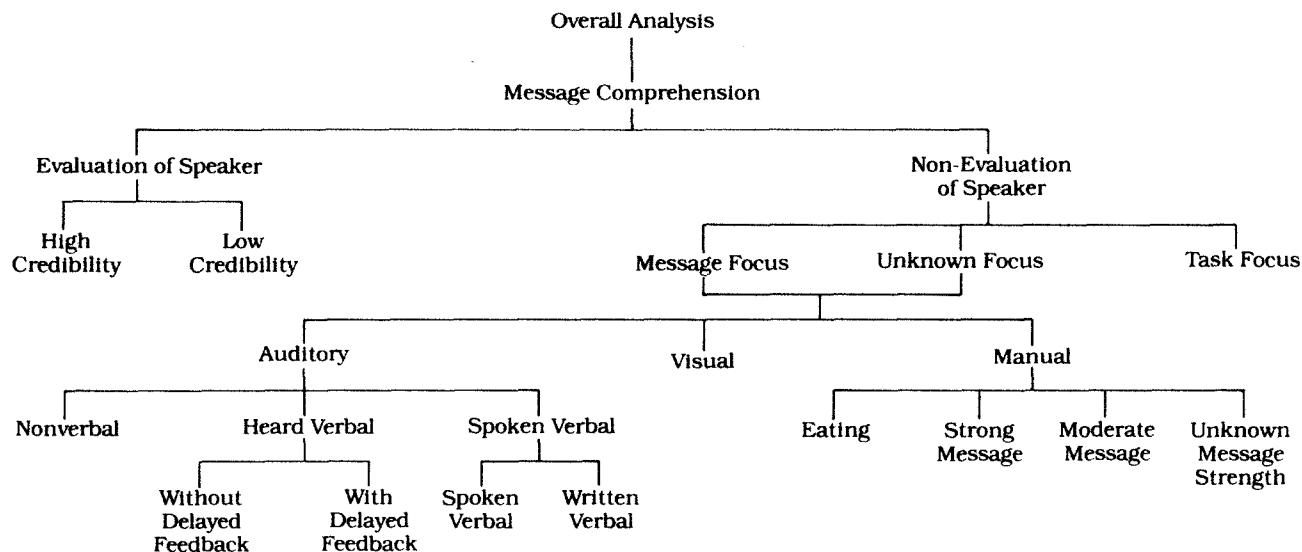


FIGURE 1
META-ANALYSIS DECISION TREE

were then performed. First, estimates were classified as being generated by experiments that caused the receivers to evaluate the speaker or by experiments that did not require evaluation of the speaker (including those where the focus was unknown). In the evaluation of speaker subset, estimates had to be further divided into those that resulted from high-credible versus low-credible speakers to obtain stable correlations. The non-evaluation subset was separated into studies requiring receivers to focus on the task, focus on the message, and where focus was unknown. The task focus group provided stable estimates, but the message and unknown focus groups were further partitioned based on the type of distractor: auditory, visual, or manual. The auditory distraction studies were grouped into those with nonverbal, heard verbal (with or without delayed feedback), and spoken verbal (spoken or written verbal) distractions. Finally, the manual distraction experiments were subdivided into eating and other manual distractions, classified according to strength of the persuasive message (strong, moderate, or unknown strength). The number of remaining estimates not producing stable correlations was too small to warrant further analysis.

RESULTS

Overall Analysis

An overall analysis of the summary correlations was performed (Table 2). For the relationship between distraction and attitude change, 104 estimates were analyzed. The overall effect of distraction on attitude change is very small (.03) and unstable as indicated by the significant chi-square.

Thirty-one estimates of the effect of distraction on counterarguing were obtained from 10 studies. The overall analysis shows that, while a significant amount of variation remains after removal of sampling error, the relationship between distraction and counterarguing is probably negative.

Three experiments provided 13 estimates of the effect of distraction on favorable thought production. The overall analysis shows that the observed variance in favorable thought production is entirely due to sampling error. Moreover, distraction has no apparent effect on favorable thought production (.00) contrary to hypotheses by Petty et al. (1976).

TABLE 2
OVERALL ANALYSIS OF DISTRACTION AND ATTITUDE CHANGE CORRELATIONS

	Distraction Correlations					Attitude Change Correlations		
	Attitude Change	Counter-arguing	Message Comprehension	Favorable Thoughts	Source Derogation	Counter-arguing	Message Comprehension	Source Derogation
Number of estimates	104.00	31.00	34.00	13.00	10.00	4.00	8.00	8.00
Number of receivers	4000.00	957.00	915.00	228.00	713.00	388.00	548.00	244.00
Average correlation (r)	+.03	-.17	-.23	.00	-.13	-.50	+.06	-.19
Variance (r)	.04	.04	.04	.01	.02	.01	.02	.04
Sampling error (r)	.01	.01	.01	.01	.00	.01	.01	.03
True Variance (r)	.03	.03	.04	.00	.01	.01	.01	.01
True Standard Deviation (r)	.19	.17	.19	.06	.11	.01	.09	.08
Chi-square	342.56 ($p < .05$)	92.58 ($p < .05$)	151.66 ($p < .05$)	5.85 ($p > .05$)	23.12 ($p < .05$)	6.44 ($p > .05$)	6.27 ($p > .05$)	1.60 ($p > .05$)

The effect of distraction on message comprehension was tested using 34 estimates from 18 studies. Overall, distraction has a modest negative effect on message comprehension ($-.23$). This estimate is also unstable.

The effect of distraction on source derogation was tested using 10 estimates provided by seven experiments. Even though the chi-square test indicates a significant amount of variation remains in the overall estimate, distraction is negatively related to source derogation ($-.13$).

The effects of counterarguing, message comprehension, and source derogation on attitude change also were tested in the overall analysis (Table 2). Though these tests were performed on only a small number of estimates, the number of persons on which the average correlations are based is large (especially by the standards of single experiments), and the power of the chi-square test is high. Thus, it is appropriate to place faith in the stable estimates produced by these three analyses.

Four estimates of the relationship between counterarguing and attitude change obtained from four experiments produced an average correlation of $-.50$. Observed variance in this estimate is completely due to sampling error. For the relationship between message comprehension and attitude change, eight estimates from six experiments were tested. The slightly positive (.06) effect was highly stable.

Finally, eight estimates of the relationship between source derogation and attitude change were analyzed, producing a negative effect ($-.19$) whose variance was all due to sampling error. Thus, increased attitude change is strongly associated with decreased counterarguing, modestly associated with decreased source derogation, and weakly associated with increased message comprehension.

Subset Analyses

To obtain more stable estimates of the relationships between distraction and attitude change, counterarguing, message comprehension, and source derogation, a series of subset analyses was performed. Decisions as to which methodological factor to divide subsets on were guided by the explanations discussed in the earlier rationale. Four variables were deemed useful: level of message comprehension, evaluation of speaker's personality, focus on distracting task, and type of distractor.

Message comprehension. As noted earlier, several researchers have suggested that distraction functions as a nonmonotonic mediator of attitude change similar to personality variables in McGuire's (1969) theory of attitude change: As distraction increases from low to moderate, it primarily affects the yielding component of

attitude change, with the greatest yielding occurring under conditions of moderate distraction; however, under conditions of moderate to high distraction, the reception component of attitude change is affected, leading to lower comprehension and less attitude change.

The small relationship between message comprehension and attitude change (.06) obtained in the overall analysis supports the idea of a nonmonotonic relationship, since it suggests that a large decrease in message comprehension would be necessary to reduce attitude change. Further, the modest relationship between distraction and message comprehension ($-.23$) indicates that only moderate to high levels of distraction would be able to produce such a large decrement in comprehension.

It was not readily apparent how to split the distraction by attitude change correlations into groups based on message comprehension for use in a subset analysis. Instead, a scatterplot of the individual study correlations of distraction with attitude change by the individual study correlations of distraction with message comprehension was constructed to see if a clear pattern was evident (Figure 2). It was expected that as the effect on message comprehension increases in a negative direction (less comprehension in the face of distraction), the effect of distraction on attitude change should initially increase positively. As distraction's effect on message comprehension became more strongly negative, the effect on attitude change should reverse and become more strongly negative. Such a pattern would indicate a nonmonotonic relationship between attitude change and distraction mediated by message comprehension. Only correlations from studies where both effects were measured were included in this scatterplot.

Figure 2 shows a slightly positive relationship exists between these two sets of correlations. The correlation between the two sets of estimates is .09 (corrected for sampling error). Thus, there is little evidence for a nonmonotonic effect. The expected positive effects on attitude change given weak negative effects on message comprehension are not apparent in a majority of the studies reporting weak effects on message comprehension. Further, large negative effects on message comprehension are not consistently associated with large negative effects on attitude change.

The lack of a clear curvilinear pattern and the small positive correlation between effects on message comprehension and effects on attitude change suggest that the relationship between distraction and attitude change is linear, not nonmonotonic. This relationship also seems very flat, as suggested by Insko et al. (1974). Large negative effects on message comprehension are necessary to produce significant decreases in attitude change.

Evaluation of the speaker. Baron et al. (1973) claim that the effects produced by Allyn and Festinger's (1961) technique of distracting the persuadee by having her/him focus on the speaker's personality are due to the credibility of the speaker rather than to disruption of counterarguing. This same process is likely to occur when an unexpected violation of nonverbal expectations is encountered by a communicator (Stacks & Burgoon, 1981). Thus, the correlations from studies that either explicitly direct or implicitly cause receivers to focus on the speaker rather than the message likely will produce effects different from studies employing nonspeaker-centered distractors. Therefore, the remaining studies were divided into speaker-centered and nonspeaker-centered subsets.

Included in the group of speaker-centered studies were estimates from studies by Allyn and Festinger (1961), Freedman and Sears (1965), Miller and Levy (1967),

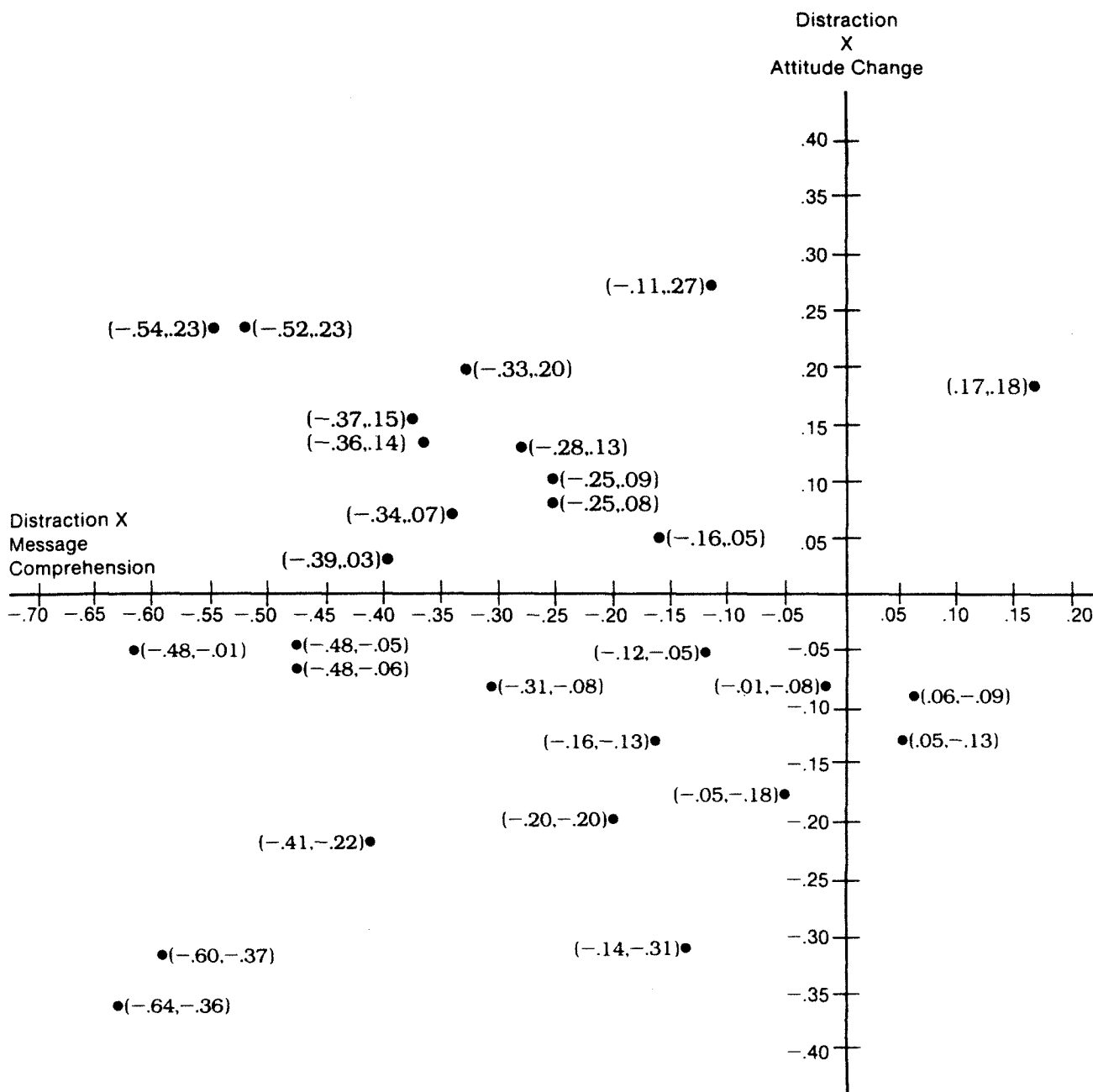


FIGURE 2

SCATTERPLOT OF CORRELATIONS OF DISTRACTION WITH ATTITUDE CHANGE BY CORRELATIONS OF DISTRACTION WITH MESSAGE COMPREHENSION

Burgoon et al. (1978), Stacks and Burgoon (1981), Woodall and Burgoon (1981), and Burgoon et al. (1982). These studies provided 19 estimates of the effect of distraction on attitude change (Table 3). While variation in the average correlation of distraction with attitude change in the speaker-centered group was not trivial, it is smaller than in the overall analysis.

Inspection of the seven speaker-centered manipulations revealed that both high- and low-credible sources were used. Therefore, the estimates were further divided into those from experiments using high-credible sources and those using low-credible sources.

Table 3 reveals that the observed variance in the distraction by attitude change correlations in the speaker-centered subset is totally attributable to the credibility of the speaker. Given a high-credible source, a receiver induced to focus on source

TABLE 3
EVALUATION SET SUBSET ANALYSIS

	Evaluation Set						Non-Evaluation Set Attitude Change	
	Attitude Change		Credibility High	Low	Source Derogation	Counter- arguing		Message Comprehension
	Overall							
Number of estimates	19.00	11.00	7.00	4.00	2.00	4.00	85.00	
Number of receivers	1276.00	736.00	540.00	558.00	207.00	207.00	2724.00	
Average correlation (r)	+.05	+.15	-.10	-.03	.00	-.02	+.02	
Variance (r)	.02	.01	.00	.01	.00	.01	.06	
Sampling error (r)	.00	.00	.00	.00	.00	.00	.01	
True Variance (r)	.02	.01	.00	.01	.00	.00	.05	
True Standard Deviation (r)	.26	.08	.00	.89	.00	.05	.22	
Chi-square	60.45	14.31		6.04		2.40	331.82	
	($p < .05$)	($p > .05$)		($p > .05$)		($p > .05$)	($p < .05$)	

characteristics will exhibit more attitude change than a receiver focusing instead on the message. Less change will occur among receivers focusing on speaker characteristics when listening to a low-credible speaker.

Thus, Baron et al.'s (1973) original contention appears to be correct. In addition, violations of nonverbal expectations apparently are capable of creating such source focus. Burgoon and her colleagues note this possibility in their explanation of the results; however, they do not fully dismiss the counterargument disruption hypothesis. These data suggest that they should.

A related estimate involves the relationship of distraction to source derogation. Table 3 shows that distraction in the form of evaluation of the speaker has a slight tendency to reduce source derogation ($-.03$). This effect is small and does not override the effect of source credibility. Further evidence for the overriding effect of credibility comes from the very small effects of distraction on counterarguing and message comprehension derived from the results of Woodall and Burgoon (1981). It seems apparent that neither counterarguing nor message comprehension functions as a mediator in this study.

Task focus. Zimbardo et al. (1970) and others have found that differential effects of distraction can be produced by directing the receiver to focus either on the distracting task or the persuasive message. Specifically, they report that focus on the distracting task produces less attitude change. A subset of four experiments was identified as inducing task focus: Haaland and Venkatesen (1968), Zimbardo et al. (1970, Experiments 1 and 2), and Insko et al. (1974). Eight estimates of the effect of distraction on attitude change were obtained from this subset (Table 4).

The resulting average correlation between distraction and attitude change ($-.25$) is highly stable, indicating that focus on the distracting task produces less attitude change than nondirected focus. In addition, the estimates of distraction's effect on counterarguing and message comprehension are highly stable. Focus on the distracting task is strongly related to reduction in message comprehension and modestly related to a decrement in counterarguing. The estimate of the effect of distraction on attitude change is very different from the less stable estimate produced in the remaining two groups—those in which focus was on the message (21 experiments) or those in which the focus was unknown (8 experiments). The similarity of the variance in the two estimates in Table 4 indicates the difference between these two

TABLE 4
TASK FOCUS SUBSET ANALYSIS

	Task Focus Subset			Message Focus	Unknown Focus
	Attitude Change	Counter-arguing	Message Comprehension	Attitude Change	Attitude Change
Number of estimates	8.00	2.00	3.00	52.00	25.00
Number of receivers	366.00	102.00	53.00	1273.00	630.00
Average correlation (r)	-.25	-.15	-.51	+.09	+.06
Variance (r)	.01	.01	.01	.05	.05
Sampling error (r)	.01	.02	.01	.01	.01
True Variance (r)	.01	.00	.00	.04	.04
True Standard Deviation (r)	.08	.00	.05	.20	.19
Chi-square	7.82		1.05	142.58	77.47
	($p > .05$)		($p > .05$)	($p < .05$)	($p < .05$)

groups is probably trivial. Obviously, though, the effect of distraction on attitude change is different in the task focus experiments.

Type of distraction. The last two subset analyses have shown that the receiver's focus and the type of distracting task are important factors influencing the effect of distraction on attitude change. Therefore, the final subset analyses focused on differences among the distracting tasks in the remaining 29 experiments.

Researchers in the distraction area have suggested that the type of distracting task has a large impact on the underlying psychological processes and subsequently on attitude change. Based on the comments of these researchers and an examination of the distracting tasks themselves, the tasks were classified into three groups: auditory, visual, and manual distraction. Within the auditory group, three different types of stimuli seem important—nonverbal, heard verbal, and spoken verbal distractions. The manual group was also further divided into estimates from eating tasks and estimates from all other tasks. While it has been suggested that eating might be distracting (Baron et al., 1973), there was a desire to determine whether the eating task differed from other manual distractors.

The experiments were divided into nonverbal auditory (Regan & Cheng, 1973; Romer, 1979, Experiments 1 and 2; Rule & Rehill, 1970; Silverman & Regula, 1968; Zimbardo & Ebbesen, 1970, Experiment 1); heard verbal auditory (Brandt, 1979; Haslett, 1976; Zimbardo, 1965, Experiments 1 and 2; Zimbardo & Ebbesen, 1970, Experiments 1 and 2); spoken verbal (Burgoon et al., 1979; Keating & Brock, 1974; Osterhouse & Brock, 1970, Experiments 1 and 2); visual (Festinger & Maccoby, 1964; Haslett, 1976; Keating & Brock, 1974; Rosenblatt, 1966; Shamo & Meador, 1969); eating (Janis et al., 1965); and manual (Harkins & Petty, 1981; Haslett, 1976; Insko et al., 1974; Keating & Brock, 1974; Petty et al., 1976, Experiment 1; Vohs, 1964; Vohs & Garrett, 1968, Zimbardo et al., 1970, Experiments 1, 2, and 3).⁴

Table 5 shows the results of the nonverbal auditory distraction subset analysis. Receivers exposed to nonverbal auditory distraction exhibit slightly less attitude change ($-.05$) and much less message comprehension ($-.32$) than receivers who hear the persuasive message without this distraction. This large, though unstable, effect on message comprehension suggests that the reduction in attitude change may be due to the decrement in comprehension rather than to disruption of counterargu-

TABLE 5
NONVERBAL AND HEARD VERBAL AUDITORY DISTRACTION SUBSET ANALYSES

	Nonverbal		Heard Verbal		
	Attitude Change	Message Comprehension	Without Delayed Feedback Attitude Change	Counter-arguing	Delayed Feedback Attitude Change
Number of estimates	11.00	7.00	5.00	3.00	7.00
Number of receivers	476.00	332.00	182.00	132.00	186.00
Average correlation (<i>r</i>)	-.05	-.32	+.12	-.21	+.45
Variance (<i>r</i>)	.03	.05	.03	.16	.06
Sampling error (<i>r</i>)	.01	.01	.02	.02	.01
True Variance (<i>r</i>)	.02	.04	.00	.14	.05
True Standard Deviation (<i>r</i>)	.14	.21	.07	.37	.22
Chi-square	16.79 (<i>p</i> > .05)	32.14 (<i>p</i> < .05)	1.19 (<i>p</i> > .05)	19.94 (<i>p</i> < .05)	25.12 (<i>p</i> < .05)

ing. However, the lack of counterarguing estimates in these studies makes this conclusion speculative.

The initial analysis of heard verbal auditory distractors provided an unstable positive average correlation between this type of distraction and attitude change (.28, $\chi^2 = 37.58$, $p < .05$). The large difference between this average and the average in the original group (.09, .06 from Table 4) indicates that there is some real difference attributable to this distractor.

On examination, it was apparent that this subset primarily included two types of heard verbal auditory distractors—those originating from some outside sources and those produced by the receiver. The latter type was specific to four role-playing experiments conducted by Zimbardo (1965) and Zimbardo and Ebbesen (1970). In their experiments participants served as both source and receiver by reading a persuasive speech. The distraction manipulation consisted of delaying the feedback of the speech to the participants listening through headphones. Two additional analyses were performed, one on the group of heard verbal auditory distractors without delayed feedback estimates and the other on the group of delayed feedback estimates (Table 5).

The positive correlation between heard verbal auditory distraction without delayed feedback and attitude change (.12) is stable, but the negative correlation between heard verbal auditory distraction without delayed feedback and counterarguing (–.21) is not. Its size suggests that the true correlation is indeed negative. Unfortunately, no estimates of the correlation between this type of distraction and message comprehension were available.

The effect of delayed feedback on attitude change is also positive (.45); however, this estimate is very unstable. It is unclear what factors may be producing this positive effect, since summary statistics on counterarguing and message comprehension were not available. Neither was it clear what methodological factors may further reduce the variance in the obtained correlation; therefore, no further analyses were conducted on these four experiments. What is apparent is that heard verbal auditory distraction in the form of delayed feedback increases attitude change more than other forms of heard verbal auditory feedback. Perhaps the delayed feedback manipulation functions like a second message. The receiver first hears her or his own vocalizations and then hears the delayed feedback shortly thereafter.

TABLE 6
SPOKEN VERBAL AUDITORY DISTRACTION SUBSET ANALYSIS

	Spoken Verbal			Written Attitude Change
	Attitude Change	Counter- arguing	Message Comprehension	
Number of estimates	10.00	7.00	5.00	3.00
Number of receivers	354.00	354.00	246.00	60.00
Average correlation (r)	+.03	-.22	-.28	-.17
Variance (r)	.05	.02	.01	.01
Sampling error (r)	.01	.01	.01	.01
True Variance (r)	.04	.01	.00	.00
True Standard Deviation (r)	.19	.09	.00	.00
Chi-square	39.75 ($p < .05$)	8.26 ($p > .05$)		

As with the previous analysis, the initial analysis of the spoken verbal distraction subset produced an unstable average correlation between distraction and attitude change (.07, $\chi^2 = 33.34$, $p < .05$); however, when the correlations from the experiment employing written distraction (Burgoon et al., 1979) were analyzed separately, stable estimates were obtained (Table 6).

The estimate of the effect of spoken verbal distraction on attitude change is only slightly greater than zero (.03) and not stable, but the estimates of the effect of this type of distraction on counterarguing (-.22) and message comprehension (-.28) are stable. Both show that receivers listening to a persuasive message in the presence of spoken verbal distraction produce less counterarguments and comprehend less of the message.

Written verbal distraction is negatively related to attitude change (-.17). The cause of this effect is not immediately apparent, since counterarguing and message comprehension were not measured. The credibility of the speaker was manipulated in this experiment; however, the results do not correspond to the effects obtained in the analysis of the evaluation set correlations. Even though both high and low credibility were present, the average correlation between distraction and attitude change was stable when the data were collapsed across the two levels of credibility.

Analysis of the estimates of visual distraction produced stable estimates for attitude

TABLE 7
VISUAL DISTRACTION AND EATING SUBSET ANALYSES

	Visual			Eating Attitude Change
	Attitude Change	Counter- arguing	Message Comprehension	
Number of estimates	9.00	7.00	1.00	12.00
Number of receivers	514.00	98.00	183.00	127.00
Average correlation (r)	+.17	-.28	-.52*	+.16
Variance (r)	.01	.02		.03
Sampling error (r)	.01	.01	.00	.01
True Variance (r)	.00	.01		.02
True Standard Deviation (r)	.02	.10		.14
Chi-square	0.53 ($p > .05$)	1.77 ($p > .05$)		16.12 ($p > .05$)

*Due to single estimate, no variance estimates can be calculated.

change and counterarguing (Table 7). The presence of a visual distractor during a persuasive message increases attitude change (.17) and decreases counterarguing (-.28). The one estimate of message comprehension suggests that visual distraction also has a negative impact on message comprehension; however, the strength of this relationship is unknown. The lack of an adequate estimate of comprehension precludes testing a causal link between attitude change and comprehension given a visual distraction. Further, it prohibits dismissing comprehension in favor of an explanation involving counterarguing.

The results of the analysis of Janis et al.'s (1965) eating study also provided a stable positive correlation between eating and attitude (.16, Table 7), indicating attitude change was greater among those who consumed food and drink while listening to the persuasive message. This result is even more interesting because it includes the effects of a foul odor as well as eating.

The explanation provided by Janis et al. is that the effects were due to positive gratification produced by the food; however, the effect of a foul odor included in calculating this average correlation does not change the positive effect. Thus, positive gratification may not be the only mediator in this process. The experimenter in Janis et al.'s study did not assume responsibility for the presence of the foul odor, and this may have removed any potential effect of the foul odor on the credibility of the source, producing no reduction in attitude change. Such an effect suggests that eating did not have an impact on source credibility, since change was similar for situations where food was presented and where it was not. Unfortunately, like other analyses, the lack of measurement of other cognitive response variables inhibits the examination of the cognitive processes responsible for the attitude change effect.

The final subset analysis was conducted on the subset of experiments using manual distractors. The initial test produced an unstable, slightly negative estimate of the relationship between manual distraction and attitude change (-.02, $\chi^2 = 34.37$, $p < .05$). Examination of the correlations suggested that the variation is due to the strength of the persuasive message. The estimates were divided into strong message, moderate message, and unknown message groups, producing different stable estimates (Table 8).

Manual distraction during a strong message serves to decrease attitude change (-.15), slightly decrease counterarguing (-.06), and modestly decrease message comprehension (-.10). Conversely, manual distraction during a message of moderate strength increases attitude change (.21) and decreases counterarguing (-.19), though this latter estimate is not stable. Finally, manual distraction during messages

TABLE 8
MANUAL DISTRACTION SUBSET ANALYSIS FOR THREE MESSAGE STRENGTH SUBSETS

	Strong Message			Moderate Message		Unknown Message		
	Attitude Change	Counter-arguing	Message Comprehension	Attitude Change	Counter-arguing	Attitude Change	Counter-arguing	Message Comprehension
Number of estimates	6.00	3.00	3.00	5.00	5.00	8.00	2.00	4.00
Number of receivers	156.00	66.00	90.00	234.00	152.00	286.00	106.00	280.00
Average correlation (r)	-.15	-.06	-.10	+.21	-.19	-.07	-.05	-.31
Variance (r)	.01	.00	.00	.01	.07	.04	.02	.01
Sampling error (r)	.01	.01	.01	.01	.01	.01	.02	.02
True Variance (r)	.00	.00	.00	.00	.06	.03	.00	.00
True Standard Deviation (r)	.01*	.00	.00	.00	.25	.03	.00	.00
Chi-square	0.10				32.67	17.29		
	($p > .05$)				($p < .05$)	($p < .05$)		

*Due to rounding, true variance of r was reported as .000, though sufficient variance remained to obtain the true standard deviation of r .

of unknown strength slightly decreases attitude change ($-.07$) and counterarguing ($-.05$), and moderately decreases message comprehension ($-.31$).

The results of the experiments using strong messages and messages of unknown strength suggest that message comprehension may be more important than counterarguing, due to the larger negative effect of manual distraction on comprehension. The results of studies employing moderate messages suggest the opposite; however, the estimate of counterarguing is unstable. Moreover, the individual study correlations between distraction and attitude change are positively correlated with the individual study correlations between distraction and counterarguing (.19) in the same studies, suggesting some positive relationship between attitude change and counterarguing.

DISCUSSION

The above analyses reveal that violations of communication expectations serve as distractors that shift the focus of the receiver from the message to source characteristics, leading to credibility effects on attitude change. This suggests that it is useful from the standpoint of communication research to delineate between communication irrelevant distractors not perceived to be intentionally controlled by the source and communication relevant distractors perceived to be intentionally controlled by the source. The effect of communication irrelevant distraction on attitude change is primarily mediated by distraction's effect on message comprehension and the focus of the receiver is critical in these situations. Also, contrary to the conclusions of many other researchers, communication irrelevant distraction generally reduces the efficacy of a persuasive message. Counterarguments, while generally reduced by distraction, do not vary consistent with variations in attitude change. Different types of communication irrelevant distractors produce different sized effects on attitude change and message comprehension. Finally, the overall effect of distraction on attitude change appears moderate at best, though the potential for large impact exists.

The results of the meta-analysis reveal that the effects attributed to distractions that cause the receiver to attend to speaker characteristics are due to credibility judgments based on these speaker characteristics and not on the distraction per se. Though it can be argued that speaker characteristics become salient only when the receiver's attention is "distracted" by them, it does not seem appropriate to call such attention-shifting cues distracting in the same way that an environmentally produced stimulus (e.g., beeps, flashing lights, etc.) is called distracting. The concept of distraction in much of the literature involves the notion of an irrelevant stimulus dividing the receiver's attention between the irrelevant stimulus and the message. However, in the present case, the distracting stimulus is by no means irrelevant to the communication. In fact, its relevancy is instrumental in the outcomes, causing the receiver to form judgments concerning the credibility (and more generally the personality) of the speaker that affect subsequent attitude change. Thus, it seems useful to distinguish between communication irrelevant distractors that divert the receiver's attention to factors external to the interaction and communication relevant distractors that shift the receiver's attention to cues within the interaction.

Specifically, communication relevant distractors should be defined as behaviors or environmental stimuli perceived to be intentionally manipulated by the source that cause the receiver to shift attention from the verbal message to source characteristics.

This distinction suggests a research program aimed at identifying communication behaviors causing such attentional shifts. Nonnormative proxemic shifts (Burgoon et al., 1982) and dissynchronous kinesic behaviors (Woodall & Burgoon, 1982) are two types of attention-shifting cues. Other possibilities include anxiety cues, physical appearance cues, and inconsistency between nonverbal channels and idiosyncratic nonnormative behaviors. Further research should also focus on the types of judgments produced by communication relevant distractors. Possibly judgments other than credibility (e.g., attraction, emotionality) produce similar attitude change results.

Another factor concerning the receiver's focus is also important. The amount of attention irrelevant stimuli received affects the degree of attitude change. This is not surprising. Given that the receiver in the task focus experiments was led to believe that the distracting task was of primary importance, attention to the message must have been low. Nor is it surprising that counterarguing was lower when the receiver focused on the task, since message processing was lower under these conditions, as evidenced by the lower comprehension scores. A necessary condition for the development of counterarguments is the reception of the persuasive argument. The results of this subset analysis suggest that distraction's effect on message comprehension may be more important than its effect on counterarguing (Table 4). The effect of comprehension is much larger in magnitude ($-.51$) than the effect of counterarguing ($-.15$), and the attentional characteristics of the task focus situation imply that comprehension is the key mediator of attitude change. The negative direction of the attitude change relationship in this analysis is contrary to the counterargument disruption hypothesis but consistent with an information processing notion of comprehension effects.

The results of the subset analyses on the different types of distracting tasks provide further evidence for the mediating role of message comprehension. In most cases where stable estimates of message comprehension and attitude change were obtained, the direction of these two estimates corresponded with an information processing theory of attitude change, where comprehension is positively related to attitude change. In particular, the results for the nonverbal auditory distraction and manual distraction during strong messages provide confirming evidence for this relationship. While the estimate of the message comprehension effect is unstable in the former case, the size of the correlation leaves no doubt that nonverbal auditory distraction produces less comprehension, thus confirming the relationship.

The analysis of manual distraction during strong messages is especially interesting. The effect of this type of distraction on counterarguing is inconsistent with the counterargument disruption hypothesis, and the effect on message comprehension supports the comprehension reduction explanation. Support is also provided by the results of the analysis of manual distraction during messages of unknown strength; however, the estimate of the attitude change effect is unstable. Finally, variations in message comprehension are more consistent with variations in attitude change across all the subset analyses than are variations in counterarguing.

Related to the comprehension versus counterarguing issue are the findings concerning the effect of distraction on favorable thought production. According to the dominant thought disruption hypothesis advanced by Petty et al. (1976), distraction interferes with the dominant cognitive processes during receipt of a persuasive message. When the message is proattitudinal, distraction reduces favorable thoughts;

when the message is counterattitudinal, distraction reduces counterarguments. Unfortunately for this hypothesis, distraction is not related to favorable thought production at all (.00). This finding indirectly disconfirms the counterargument disruption hypothesis, since the hypothesis is incorporated in the dominant thought disruption model. If distraction does not affect favorable thoughts, it seems unreasonable to conclude that distraction does affect counterarguing. Petty, himself, provides supporting evidence for the information processing effect of comprehension on attitude change (Harkins & Petty, 1981), included in the subset analysis of manual distraction during a strong message.

Although the counterargument disruption hypothesis is supported in a few of the analyses, the size, stability, and availability of the effect estimates weaken this support. In the analysis of the spoken verbal auditory distraction subset, attitude change was positive, though this effect estimate is very low and unstable. Results of the visual, heard verbal auditory, and spoken verbal auditory distraction subset analyses also support the counterargument disruption hypothesis. In the first case, though, only one estimate of message comprehension was available; in the second the counterarguing estimate was too unstable to be sure of its direction, and in the third the attitude change estimate was unstable.

It remains puzzling, however, why in a few analyses attitude change increased. Perhaps the lack of comprehension in these cases caused the receivers to miss information that reveals invalidities in the arguments, leading to the erroneous conclusion that the arguments were logically sound. This may have occurred in the case of manual distraction during receipt of a moderately strong or a weak message. This suggests a nonmonotonic relationship as proposed by McGuire (1969). A slight reduction in comprehension of a weak message increases yielding by masking invalidities, while greater reductions decrease yielding by blocking receipt of any portion of the message. The scatterplot in Figure 2 suggests that such a nonmonotonic relationship, if it occurs at all, is weak at best.

Though the bulk of the results support the conclusion that the message comprehension explanation is more tenable than the counterargument disruption hypothesis, weaknesses in past research suggest caution about accepting such a conclusion. Earlier it was noted that some researchers have questioned the validity of the counterarguing measures. (Miller & Baron, 1973; Romer, 1979). Further, not all studies included in the meta-analysis measured counterarguing, though not all measured comprehension either. Table 2 reveals that only 31 estimates of distraction's effect on counterarguing relative to 104 estimates of its effect on attitude change were obtained from the included studies. Finally, only four estimates of the correlation between attitude change and counterarguing were available (Table 2). These estimates do suggest a negative relationship between attitude change and counterarguing as predicted by the counterarguing hypothesis. But as noted earlier, some researchers have speculated that the counterarguing measures actually assess attitude change not counterargument production, since they are generally completed following assessments of post-message attitude change.

Two other factors merit more research attention: the persuasive message and the focus of the receiver. While a number of researchers suggest that message structure and topic are important, few actually included controls on the message in their studies. Lack of adequate descriptions of the actual messages was surprising and posed difficulties in the subset analyses. This lack of information led to the use of a

crude measure of message strength in the meta-analysis and may have contributed to the small effect of this variable. In a related vein, the lack of a direct assessment of the extent to which receivers focus on the distracting task also hindered the subset analyses. Variance due to receiver focus could not be examined in some studies. Thus, these two variables may account for a portion of the non-trivial variance that remained in some of the estimates.

The different effects produced by the various distractors underscore the need for more specific examination of different types of distractors as they relate to message comprehension and attitude change. The classification of distractor types employed in the subset analyses was based on speculations by prior researchers on the types of distractors most likely to affect attitude change. This classification, admittedly, was convenient as well as theoretically interesting. A better classification system might be developed based on the cognitive load produced by the different distractor types. Perhaps as the cognitive load needed to overcome the distractor increases, message comprehension decreases, producing less attitude change. Such a cognitive load effect is imbedded in the notion that a verbal distractor is more likely to impact attitude change because it will interrupt subvocal counterarguing.

In the current meta-analysis, measures of cognitive load were not available, though one could speculate that cognitive load increases as one moves from passive reception of nonverbal auditory and visual stimuli, to passive reception of verbal auditory stimuli, to production of verbal stimuli and performance of manual tasks. This ordering would need to be tested prior to using it to classify the distractors in past studies. Glass et al. (1981) suggest such a post hoc technique. Still, the current classification system provided results with important implications for the efficacy of the message comprehension and counterarguing explanations without a direct test of the cognitive load of the distractors. Thus, it seemed a useful procedure for the current analysis.

Finally, it seems necessary to speculate on the size of the effect of irrelevant distraction on attitude change. The results of the subset analyses show that the effect is modest at best. Perhaps distraction is only a small factor in the overall communication context, though given the importance of message comprehension to attitude change, the potential effect is large. However, receivers can and do overcome distraction and large changes in comprehension may be necessary to reduce attitude change greatly.

NOTES

¹The effort justification, affect reaction, and evaluation apprehension/demand characteristics explanations also predict increased attitude change given distraction based on dissonance reduction, positive emotional reactions to the source, and desire for favorable experimenter evaluation, respectively.

²The excluded studies are Breitrose (1966), Gardner (1966), Zimbardo, Ebbesen, and Fraser (1969a, b), Tesser and Leone (1977), Watts and Holt (1979, only the message comprehension effect could be estimated in this study), and Lammers and Becker (1980).

³The chi-square goodness of fit test is a relatively powerful test. It will at times remain significant in the presence of trivial variance (Hunter et al., 1982). This suggests that a nonsignificant chi-square can be considered strong evidence that the remaining variance is, in fact, trivial. Since the variance remaining in the average correlation after correction for sampling error is included as a multiplicative factor in the calculation of the chi-square statistic, the chi-square equals zero in cases where the true variance in the average correlation equals zero. In the tables, no chi-square values are reported for average correlations whose true variance equals zero.

⁴The one case where the verbal stimulus was read was included in the heard verbal category, since reading and hearing were viewed as equivalent verbal processes. Similarly, the one case where the distractor was a written verbal task was included in the spoken verbal group.

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