

The problem of causality in cultivation research

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Abstract

This paper offers an up-to-date review of problems in determining causal relationships in cultivation research, and considers the research rationales of various approaches with special reference to causal interpretation. It describes in turn a number of methodologies for addressing the problem and resolving it as far as this is possible. The issue of causal inference arises not only in cultivation research, however, but is basic to all media effects theories and approaches primarily at the macro-level whose main methodology rests on correlational studies (agenda-setting, spiral of silence, knowledge gap hypothesis, etc.). We therefore first discuss problems of causal interpretation in connection with the cultivation hypothesis, and then sketch in summary how these problems arise with other media effects theories. We first set out the basic features of the cultivation approach, then consider the difficulties with correlational studies and discuss alternative research designs – designs which are not original to us, but have been adapted for cultivation research. These comprise laboratory experiments, sequential studies, social studies and time-series procedures. Finally, we argue for multiple approaches that complement one another's advantages and balance out their disadvantages.

Keywords: cultivation, casual inference, correlational studies, experimental approaches, sequential studies, time series

The classical cultivation approach

The cultivation approach initially focused on the presentation and effect of violence on television. It was prompted by a study by George Gerbner commissioned for the 'National Commission on the Causes and Prevention of Violence', which was set up following the murders of Martin Luther King and Bobby Kennedy. The cultivation approach sees televi-

sion as a comprehensive secondary factor in socialization; citizens of modern societies draw on television for much of their experience of the world around them, and build their perception of reality from messages provided by the mass media. Television is of central importance because of its universal availability, its extensive reach and the intensive use made of it. Also, television does not have to be learned, like reading and comprehending print media, and it provides across all channels, program types and individual broadcasts a self-contained and stable system of uniform messages. The uniformity of the televised messages and their immediacy account for the medium's socializing power (see reviews by Gerbner and Gross, 1976a; Gerbner, Gross, Morgan, and Signorielli, 1994; Morgan and Shanahan, 1997; Schenk, 2002: 537–567).

Because of the posited long-term effect of television and the absence of a control group of non-viewers, Gerbner's cultivation approach cannot be evaluated using classical laboratory experiments (see section 2 below). Nevertheless, a clear assumption about effects underlies the approach; the uniform television messages, indiscriminately viewed by users of the medium, are the cause of an altered perception of reality on their part (effect)¹. The perception of reality is changed to the extent that recipients use television per se (with uniform messages). Because an experimental approach appears to be ruled out, Gerbner's empirical study employs a two-stage process. In the first stage, he undertakes a message system analysis. This is based on a quantitative content analysis, in which constantly-repeated content items (pictures, norms and values which remain constant across genres) are identified. Content analysis is followed by a comparison of the world as presented by television with data based on reality, thus revealing discrepancies between the two. In the second stage Gerbner conducts a cultivation analysis. By means of a representative public survey, data are collected on television use (especially with regard to the time spent viewing) and viewers' perception of reality. A distinction is made between heavy and light viewers. Light viewers spend below-average time watching television, and view in a planned manner. Heavy viewers utilize television more than average, and are less selective, and are thus exposed to the same messages across all program contents, formats and individual broadcasts. Perceived reality is indexed by choices between two possible answers, the so-called television answer and the reality answer. The television answer more or less reflects the picture provided by television as revealed by the content analysis, while the reality answer is closer to that of the actual situation. If the heavy viewers give the television answer more often, this is evidence according to the cultivation hypothesis of the effect of television. The best-known example of such an analysis relates to the 'scary world' hypothesis developed by Gerbner (see, for example, Gerbner and Gross,

1976b). Based on the high proportion of violence in all television genres – as measured by content analyses – Gerbner supposes that heavy viewers regard the world as more violent and so more frightening. Heavy and light viewers were asked, for example, what proportion of the population is involved in fighting crime. The television answer was ten per cent, the reality answer one per cent. The estimate of the true proportion is described as a first-order cultivation effect. Viewers were also asked whether they were anxious about going out alone at night. Such questions relate to second-order cultivation effects. Gerbner found that heavy viewers rated the proportion of people engaged in fighting crime higher, and were also more anxious and feared violence more.

The results of numerous studies point slightly in the direction predicted by the cultivation approach, that is, heavy viewers tend to give the television answer more often. The meta-analysis by Morgan and Shanahan (1997) of available empirical studies indicates the same. These studies now cover a remarkably broad spectrum, cultivation effects being studied for example with reference to gender roles, health, science, education and politics. The meta-analysis showed a relatively weak relationship between television use and cultivation ($r = 0.09$). Despite the rather stable links found, this approach has been criticized in a number of ways, although we shall not go into these further here (see Hirsch, 1980; reviews by Rossmann, 2002; Schenk, 2002). This aside, the cultivation approach has advantages that are of increasing importance. It turns out to be one of the few approaches to media effects to deal with the influence of fictional programs, and it envisages entertainment material as having social and even political consequences. This means that entertainment has effects beyond leaving recipients with a mere feeling of being entertained (see Früh, 2002). Studies are needed on the effects of entertainment, especially as the entertainment genre is increasingly dominant, and Weiss (2001) has even noted a de-politicizing of informational broadcasts (in public service broadcasting too, it should be noted) in his report to the German regional broadcasting authorities in the public service sector. The cultivation approach thus broadens the investigative spectrum. It is not only the political media content which is intensively researched in Germany that has political effects, but also entertainment content, even if viewers consistently claim they do not confuse fictional programs and reality.

The problem of causal interpretation

Central to this paper is the implied ability of the cultivation approach to permit conclusions about a causal relationship between television viewing and the perception of reality. Heavy viewers perceive the real

world as more dangerous because they are often confronted with violence on television. Underlying this are two assumptions that merit further consideration. It is true that, in the context of the television landscape of the 1970s, Gerbner assumed a non-selective use of the medium. This means that frequent viewers, regardless of viewing choice, also actually encountered whatever messages were on offer more frequently. At the same time, Gerbner supposed that television presented the same content material across all program genres, so that, even if viewers were selective (and, given the smaller number of channels with the same contents in 1970 and the lack of remote control at that time, this was certainly less the case than now), they would encounter the same content everywhere. From the point of view of a causal analysis, therefore, television provided a homogeneous, unitary stimulus, whose cumulative and consonant impact would have the assumed effects. Nowadays, the degree of selectivity may be considerably greater. Remote control allows rapid and frequent channel switching, while the choice on offer has increased. Most households with television in Germany have cable or satellite, making at least 30 channels freely available, among them many with specialized content categories meeting viewers' specialized interests.

Viewers can thus arrange their viewing in line with their own interests much more than before. Hence we may now expect frequent viewers to vary greatly in terms of what they see, and so to be exposed to quite different meta-messages². Viewers of action material will encounter a lot of violence, viewers of love stories much less, even if both spend the same amount of time in front of the television. If non-selective viewing can no longer be assumed and program variety increases, it is reasonable to suppose there are genre-specific cultivation effects³. It is no longer the time spent viewing, but the individual viewing menu that is the independent variable. This represents a remarkable shift in the cultivation approach because it is the television content, and not individuals' personal characteristics that is now central. Cultivation effects can thus change over the longer run, along with the contents, so that it is not the individual but their specific interaction with these contents that matters.

Even more to the point of our argument here is the problem of causal interpretation itself. Doob and MacDonald (1979) pointed out early on that a cross-sectional approach does not necessarily allow definitive causal interpretation. In terms of our example of the 'scary world' hypothesis, this could mean that violence portrayed on television is not necessarily the cause, and the distortion of perceived reality towards increased anxiety not necessarily the consequence; precisely the converse conclusion or even alternative explanations are possible, even likely (see Figure 1). It would make sense if, for example, people who are anxious and afraid of the world outside go out of the house less, and, because

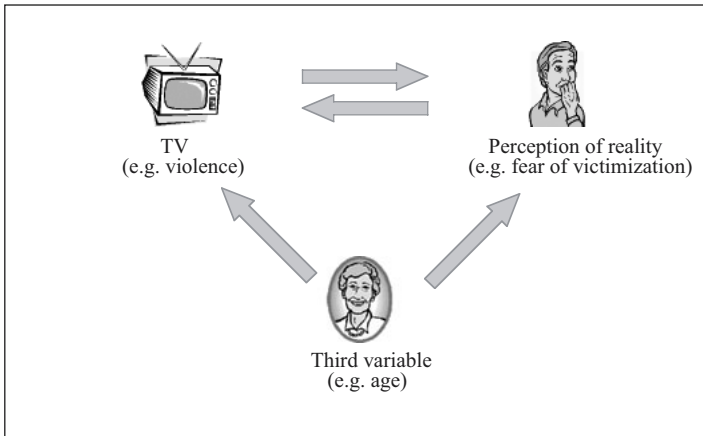


Figure 1. *The problem of causal interpretation*

they spend more time at home, also watch more television. Presumably they might also do more housework, sit more by the stove, and so on. It is just as likely that extraneous third variables account for the relation between television consumption and fear of the world. Age, for example, could be such a variable. Older people are basically more anxious than younger, are more often at home, and watch more television. Many other similar variables can be envisaged. Although in some cases, Gerbner and his associates have shown that the cultivation effect persists even when they are partialled out, their findings are not consistent.

Gerbner dispensed with classical laboratory experiments from the start for a number of reasons. For one, the laboratory experiment is only suited to examining short-term learning and perceptual phenomena; it cannot simulate the long-term aspect of the cultivation process. Additionally, regarding Gerbner's root assumption, cultivation cannot be reduced to an accumulation of individual stimuli, but depends on the comprehensive interaction of personality characteristics, events, actions and relations in television seen as a totality. Also, experimentally-measured effects are shown by changes (in attitudes, opinions, etc.) in the experimental group, while cultivation effects are evident, if at all, in small shifts, if not in a reinforcing of values. Put another way, there is no identifiable control group corresponding to the rationale of classical experiments because almost everyone in society is cultivated by the mass of television messages (Gerbner and Gross, 1976a: 180 ff.; see also Morgan and Signorielli, 1990: 17 ff.). In any case, the rare non-viewers found in every society cannot be regarded as controls because their particular

individual characteristics distinguish them from viewers of television in all other respects too (Sicking, 2000).

As with all other approaches to media effects that envisage long-term changes, simple forms of causal analysis like laboratory experiments are ruled out because they do not meet the essential conditions. Because the question of causal relationships is of central importance, alternative designs or rationales are needed. Without evidence of causal relationships, we can do no more than offer plausible accounts that can be countered simply on logical grounds, the more so, as, when dealing with long-term effects at the macro-level, one must bear in mind the possibility of feedback and interactive processes involving media content and viewer variables.

Alternative research designs

Laboratory experiments: Studying the necessary conditions

Even if the laboratory experiment is at odds with the logic underlying the cultivation approach (see above), its advantages can still be utilized in cultivation studies where limited aspects are to be studied. The advantages of the laboratory experiment, such as short-term measurement of estimates before and after presentation of media material, controlled manipulation of content, comparison of experimental and control groups (see Parducci and Sarris, 1986), can be used to study, for example, intervening variables in the cultivation process. Such variables can be processing strategies (see Shrum, 2000) or the accessibility of mental constructs and heuristic devices (Shrum and O'Guinn, 1993; Shrum, 1996). Contextual factors can likewise be studied using experiments. Examples of these factors are the degree of involvement (Shrum, 2001) or the importance of the information source in opinion formation (source priming vs. forgetting of information source; see Shrum, Wyer, and O'Guinn, 1998; Mares, 1996).

In this way, basic cognitive processes in the production of cultivation effects can be clarified. For example, in several studies Shrum (see Shrum and O'Guinn, 1993; Shrum, 1996) found that frequent viewers not only answer questions about perceived reality in line with televised representations, but do so faster than light viewers, suggesting heuristic processes in forming judgments. By receiving more messages, frequent viewers, the argument goes, have at their disposal a larger store of examples from television corresponding to different domains of reality, and can use them to form judgments by a rapid heuristic process. Findings of another study conducted by Shrum (2001) point in the same direction. The degree of involvement of three subject groups was manipulated by the

form of questions used to measure frequency estimates. One group (low involvement, heuristic) answered relatively quickly without intense reflection. A second (high involvement, systematic, elaborated judgment formation) thought carefully about all the answers, while a control group had no instructions. Cultivation effects appeared only in the first and last groups. Relevant social psychological models of information-processing (elaboration likelihood model of Petty and Cacioppo, 1986; heuristic-systematic information-processing model of Chaiken and Eagly, e.g., Chaiken, 1980) suggest cultivation effects tend to occur when judgments are made quickly without much cognitive involvement, and are at least partly explained by the use of heuristic processes⁴.

As the above-mentioned makes clear, laboratory experiments can contribute to a theoretical account of the cultivation approach, although these are unable to actually test the approach. To illustrate, we can consider, along with the above findings, the fact that specific examples play a role in cultivation (Brosius and Bathelt, 1994; Zillmann and Brosius, 2000; Daschmann, 2001). These examples are brief, authentic statements by agents or victims involved in actual situations. They have more effect on recipients' judgments than objectively valid statistical information. Examples involving characters in soap operas, television presenters, and so on, could be the basis of cultivation effects, at least in part (see Brosius, 1995). The more single instances are shown relating to a particular bit of reality, the more important that bit of reality is seen to be. This would seem to show a cognitive basis to the cultivation approach. In a similar way, prototype theory is useful in an experimental context. For example, Rossmann (2002) found that in hospital soap operas, although only a few of the characters could be regarded as intriguers, frequent viewers of such programs regarded nurses and other caregivers as significantly more given to plotting and scheming than did light viewers. This could be connected to the fact that individual intriguers in hospital soap operas are more salient against the background of the rosy view of the world presented by these programs, and so influence viewers' judgments much more than the many non-scheming doctors and nurses portrayed. In summary, cognitive psychological factors in the cultivation process can indeed be studied using laboratory experiments, although in studying these intervening effects, one has to assume the basic existence of the 'cultivation' phenomenon. Thus, although laboratory experiments can certainly clarify contextual factors, they cannot provide definitive findings about the validity of the approach.

Sequential experiments

In the discussion of the rationale of laboratory experiments in recent years, a number of designs have been proposed that are applicable to

the causality question in cultivation processes. Important among these is the sequential experiment, also known in the literature as the 'longitudinal exposure experiment' (see Bryant and Zillmann, 1981), 'prolonged exposure experiment' (Zillmann, 1989; Rössler and Brosius, 2001a), 'massive exposure experiment' (Bryant and Zillmann, 1981), or 'Intensivexperiment' (Rössler and Brosius, 2001b). Participants are repeatedly exposed to media messages over a long time period under controlled conditions similar to those in laboratory experiments, and a distinction is made between experimental and control groups. On a number of separate occasions the experimental group receives television messages likely to produce cultivation effects, while the control group views other televised material. Although isolated stimuli are presented here too, and one must likewise assume that all the viewers have undergone cultivation from prior television use, uniqueness of stimulus presentation no longer holds, so any effects that occur are more of a long-term nature.

Sequential experiments are especially suitable for analyzing genre-specific cultivation effects. An example is provided by the study by Rössler and Brosius (2001a). School-children were shown edited material from German daytime talk-shows. The extracts concerned homosexuality, sexual crossover and body piercing. A control group saw edited talk-show material on other subjects. A week after the final presentation, both groups were asked *inter alia* to estimate the proportion of homosexuals in the population and give their attitudes to homosexuals. Overall it was found that the experimental group overestimated the proportion and had developed more liberal attitudes. Sequential experimentation has also been used to study cultivation effects with pornographic material (Zillmann, 1989). Participants were shown pornographic material in a number of successive sessions, and then asked questions relevant to cultivation. It was found that people who were exposed to large amounts of pornographic items gave lower ratings of the attractiveness and sexual performance of their partners and also of the quality of their relationship and family values, wanted fewer children, tended to accept unusual sexual practices and pre-marital sex more, and viewed rape and child pornography as less serious crimes. After viewing massive amounts of pornographic material, men tended to think that they were inclined to force their female partners into certain sexual practices against their will (Zillmann, 1989: 154).

Sequential experiments could also be used to study correlations between variables by controlled variation in the amount of stimulus material. Until now, only survey studies have been used (see Hirsch, 1980; Potter, 1991). The advantage of sequential experiments, however, lies precisely in the fact that the amount of stimulus material can be systematically varied. Presumably the dose needed to produce cultivation ef-

fects is smaller the more uniform the presentation of a given cultivating message. If, for example, a sex magazine always describes visits to swinger clubs in the same way, overestimates of the number of such clubs will be greater. Again, this could be tested, as could the stability of the effects by varying the time between presentation and measurement or by inserting anti-cultivation messages.

This research rationale has limitations, though. For one thing, such studies make considerable organizational and financial demands. People's willingness to go to a test studio day after day and view material they may find unappealing is rather limited, and high drop-out rates are likely. Moreover, it is hard to control what people do outside the laboratory. In the case of unusual material, there is a danger that participants exchange information with others or even view additional similar material (for a critique of the methodology see for example Iyengar and Kinder (1987), who used the procedure in agenda-setting research).

Social experiments

In social experiments, naturally-occurring differences in people's lives or their social contexts are utilized to construct experimental and control groups. In cultivation research, this presupposes major changes in the media scene at well-defined times; for example, the inauguration of television in different countries, the introduction of private channels and the associated proliferation of programs or the introduction of new genres (reality shows, games shows, etc.). The research often involves comparing two places as similar as possible in social and demographic make-up, but differing in the availability of television. Most such studies, usually not specifically designed to study cultivation, compare towns or communities with television (experimental group) to ones without (control group). The research design is often extended by taking measurements at two different times, so that, for example, the first is made in two locations without television, and the second after television has been introduced in one of them (experimental group). In this way, it is possible to draw conclusions about the effect of television from possible changes in the behavior and attitudes in the experimental group as long as the control group scores remain unchanged. Most such studies concern the introduction of television in the 1950s and 1960s. Schramm, Lyle, and Parker (1961), for example, conducted eleven studies between 1958 and 1960 comparing various places in the USA and Canada, including two comparable places in Canada (denoted 'Radiotown' and 'Teletown') and five comparable places in the Rocky Mountains in which the reach of television differed markedly⁵. They examined the influence of television on habits, attitudes, family relationships, etc. The findings

remain of interest today. Few positive effects were found in terms of providing children with intellectual stimulation, although where they were present, they consisted of highly positive effects on knowledge of the world. The main effects were negative ones on behavior (aggressiveness, especially in people lacking family support) and psychological well-being (emotional stress from anxiety-provoking material on television). Although these studies pre-date cultivation research, they are entirely consonant with the underlying ideas developed later. However, since only cross-sectional methods were used, evidence for causal interpretation is not especially compelling. Studies by Williams (1986) on the introduction of television in the 1970s are methodologically sounder. In three rural areas of Canada ('Notel' = no television at time of first measurements, 'Unitel' = single television channel available, 'Multitel' = four channels available), people took part before and after the introduction of new channels. Effects on attitude to and perception of gender roles in children, aggressive behavior, cognitive style and personality and attitudes of adults were studied. The results show that perception of gender roles is strongly influenced by television and, in the case of children, marked physical and verbal aggressiveness was seen, in accord with the findings of Schramm et al. (1961). There were few indications of a role of television in problem-solving behavior or adult personality or attitudes generally. Kepplinger, Donsbach, Hamdane, Kembli, and Skik (1985) studied the influence of television on rural populations in Tunisia that only received electricity, and hence television, in the 1980s. In summary, they concluded that television can have marked effects on the fabric of a society by creating an intellectual and social gulf, especially in terms of information, tastes and values, from an existing material one.

Social experiments have also been conducted in the so-called cable projects during the introduction of private television channels. These provided an opportunity to compare viewers already connected to cable and the multiplicity of channels it provided with those who were being newly connected and those not able to get cable television (see Noelle-Neumann and Schulz, 1989, on the Ludwigshafen pilot cable project, and more generally Becker and Schönbach, 1989). Here again, the central question was how habits change and what the consequences are for leisure behavior and family relationships. It was found that certain hitherto non-existent sub-groups of viewers developed (under the heading 'entertainment slalom'), that time spent using television increased slightly but continuously, and that there were no adverse effects on the family, but a more harmonious family life and stronger inter-personal relations.

The central requirement for social experiments is to find comparable locations or areas that differ only in terms of the media situation. If

this is not met (and it can be controlled for through before-and-after measurements), definitive causal interpretation is not possible because of a confounding of the cause with other factors. Social experiments on the introduction of new media technologies are presumably at best possible in exceptional circumstances. Finding areas where new technologies have yet to be introduced is difficult. Investigating the influence of television on the values and perceptions of reality in a remote Indian tribe raises the question of the generalizability of the results. Hence this type of design is of only limited use for the future. In any event, it could only make sense for evaluating effects of 'new media' such as digital television if its introduction were clearly staggered around the world.

Asymmetric relationships

The attempt to tackle the problem of causal interpretation in cultivation research is not new. Potter (1991) for example discussed the problem in terms of whether attitudes occur first (second-order cultivation), and estimates produced from these (first-order cultivation), or vice versa⁶. He proposed addressing this question by examining asymmetric relationships. The underlying rationale is based on seeing how many of those who show first-order cultivation effects also show second-order effects, and conversely, how many who show second-order cultivation effects also show first-order ones (measured in percentages). Asymmetric relationships were observed with material about divorce/love affairs and wealth, although not with material about working women. In the former, first-order cultivation effects were better predictors of second-order effects than vice versa. Davis and Mares (1998) applied this logic to the classical problem of causal determination in their study of cultivation with talk shows, examining how many of those who judge reality as represented in the talk shows were frequent viewers. The findings suggest that television viewing is a stronger predictor of perceived reality than vice versa. Even this does not allow a definitive causal interpretation (see Rössler and Brosius, 2001a). Although the relationships here are amenable to more precise determination and interpretation, it is nevertheless the case that attitudes, estimates and reception data are collected at the same time, so that extraneous intervening variables, whose influence cannot be properly assessed, could underlie the asymmetry. Thus two of the four prerequisites that Potter (1993) himself formulated for determining causal relationships in cultivation research are not met. Firstly, a statistically proven relationship must be found by suitable means. This must, second, be in the direction predicted from the television material presented. Third, the cause must precede the effect. Fourth, further possible causes (effects of extraneous variables) must be ruled out.

Time series procedures

Time series analyses, which are suited par excellence to verifying the temporal dynamic aspects of processes, could allow for indirect inferences about causal relationships. Here, the analysis of content and questioning of participants are related on several (at least two) points. With two test points and administration of questions to participants, cross-correlations may be calculated as in the following diagram.

An example of a longitudinal analysis of cultivation is in the study by Gerbner, Gross, Morgan, and Signorielli (1980) itself. These authors recorded television presentation, television use and perception of reality at two separate points in time, and related them to one another. The analysis is based on structural equation models, and makes it possible to work out the most likely causal model having regard to measurement errors, and to determine how well a given model describes the observed data. In this connection, Gerbner et al. (1980) found significant relationships between television use at the first point and perceived reality at the second, as well as between perceived reality at the first point and televi-

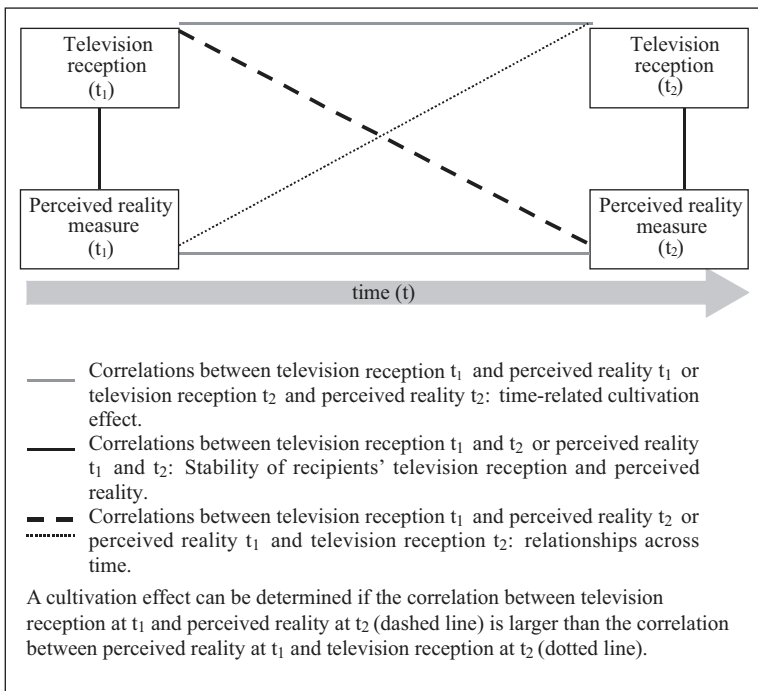


Figure 2. *Cross-correlational scheme*

sion use at the second, concluding that television had an independent effect on subsequent attitudes (see also Gerbner, Gross, Morgan, and Signorielli, 1986: 24 on interpretation of the findings). However, the stronger influence of perceived reality at the first point was ignored, which, according to the rationale of cross-correlations, points to the attitudes influencing television use, rather than to the converse.

Extending the procedure beyond two time measurements involves a time series analysis. The rationale for this will now be presented without going in detail into the statistical requirements and specific procedures (see Scheufele, 1999). It is best explained by means of so-called Granger causality, which is based in essence on cross-correlations, but also allows for the examination of the mutual dynamics of two time series. This involves first using multiple regression to estimate a perceived reality value ($yt-0$) from prior perceived reality scores ($yt-1$, $yt-2$, etc.) and calculating the explained variance. The more stable the perceived reality is, the more powerful the predictive power of prior scores will be. Subsequently, the additional contribution of the independent variable (i. e., the cultivating media message) to predicting perceived reality is determined in a further regression procedure, where the terms $xt-1$, $xt-2$, etc. are added to the model. The gain in variance accounted for can be tested for statistical significance. In this case, the prior television presentation would make its own independent contribution to explaining perceived reality, but only when the influence of prior perceived reality scores is controlled for. To test whether the two series exert mutual influence, this control procedure must also be conducted in the reverse direction. That is to say, the influence of prior messages must be examined on the current one, and then, in a further step, the additional influence of prior perceived reality in the population. The Granger causality analysis derives from economics, and has been used a number of times in communications studies on agenda-setting to show the effect of the media agenda on the agenda perceived by the public (for details, see Brosius and Keppinger, 1990). The particular advantage of this time series analysis procedure is that the number of time sampling points needed, can be quite small, although it should be more than 20.

ARIMA models represent a multifaceted analytical procedure of uni- and multivariate time series, but to be satisfactory need a larger number of time sampling points (at least 50). The rationale is similar. All the time series are first examined for trends, seasonal effects and other systematic intrinsic components. These are removed from the series and the residuals subjected to cross-correlational analysis. The form of relationships then allows a statistical evaluation of which series precedes which in time. Since a basic assumption of all effects theories entails a temporal sequence, one can at the least exclude alternative explanations. Thus,

although if series A precedes series B at a given point, this is not definitive proof of a causal relationship of the form $A \rightarrow B$, it nevertheless rules out the alternative explanation of the form $B \rightarrow A$.

The use of time series analysis has a number of prerequisites, especially in cultivation research. First, the data should be in an appropriate form. This means that measures of perceived reality (ideally first- and second-order cultivation questions) should be collected at regular time intervals, along with analysis of content of the cultivating messages at the same points. To the best of our knowledge, such data sets have not been collected up to now, presumably because research on television use has hitherto yielded relatively stable patterns of viewing (see Klövekorn, 2002). If the available media material also proves relatively stable, showing cultivation effects by time series methods will entail considerable difficulty, making the methodological demands disproportionate to any outcome. Changes in perceived reality are thus only to be expected when the strength and direction of cultivating messages changes. Since we are often dealing with meta-messages that remain constant, the possibility should first be examined systematically, because the mere occurrence of new genres or formats does not necessarily ensure that different cultivation processes are set off. Gerbner himself would presumably even expect that they are simply the same messages embedded in another format.

Conclusions

In essence the problem of causal interpretation arises in similar ways in all macro-approaches in research on media effects. Even agenda-setting research cannot after all be based just on laboratory experiments alone. Here again, the focus is on: 1) long-term changes; 2) the requirement of a large degree of external validity, and 3) strong feedback effects between media (media agenda) and recipients (public agenda). The knowledge-gap hypothesis faces the same problem. It is rarely possible to exactly define and manipulate the flow of knowledge in a society so as to exclude alternative accounts. Socio-economic status, a central independent variable in knowledge-gap research, clearly cannot be brought under experimental control because it is the outcome of people's life-long development. In the case of the spiral-of-silence theory, although some aspects can be experimentally studied, this is hardly so for perceptions of public opinion and isolation pressure, whose social relevance would be difficult to capture in an experiment. Our discussion of alternative proposals thus entails some modifications in dealing with other approaches or topic areas.

Although laboratory experiments may be the ideal method for research in some areas of psychology, this is certainly not the case in com-

munications studies. Although the alternative methods we have outlined for measuring media effects all have advantages, they also have disadvantages. The classical experiment itself is well-suited for investigating some aspects, but it cannot be used to study all the complex aspects dealt with by the different approaches. The sequential experiment provides an interesting perspective for cultivation studies. It is superbly equipped to simulate the long-term nature of cultivation and the uniformity of the messages, although a negative aspect is the large demand on resources, both in terms of numbers of participants and from an organizational point of view. Appropriately used, the social experiment certainly permits causal conjectures, although extraneous factors and possible confounding of factors need to be guarded against by using before-and-after designs. A problem faced by social experiments is the requirement that what is available from the televised media changes at different times in different regions. Only if this is the case is it possible to make meaningful before-and-after measures prior to and following the introduction of new broadcast material. However, one supposes that new media and their associated technologies tend to be increasingly introduced at the same time around the world, and that this interesting possibility for causal analysis is thus disappearing. Time series analyses mean large demands of the data collection. Studies of effects require participants to be tested and content to be analyzed at a number of fixed points, so that such studies are conducted especially where researchers can access existing sources of data. Such secondary analyses have thus often been applied in agenda-setting research, where questions about important political topics fall within the purview of various survey institutes. Time series scarcely come into consideration for cultivation analysis for the additional theoretical reason that television meta-messages and viewers' behavior in using television are relatively stable, and the requirement of change in one or the other time-series is met only to a limited extent.

In summary it can be said that there is no single method for studying cultivation effects in particular or media effects in general. Rather – and this comes close to being a truism – a methodological approach should be chosen that combines the advantages of various different approaches and eliminates their disadvantages. This means abandoning the idea of reaching meaningful findings with single studies and a single methodology. The limitations of correlational and experimental studies can only be overcome by using a combination of methods, as was pointed out at a fairly early stage (Cronbach, 1957; Hovland, 1959). In regard to cultivation studies, this also means that the cross-sectional method correlating media use and perceived reality measures found can be further examined by recourse to other methods.

Multi-method approaches can take various forms. They should be envisaged in terms of a triangulation strategy, i. e., a large-scale study using several inter-related methods (see Abel et al., 1998; Paus-Haase, 1998; Paus-Haase et al., 1999) that address the same overall situation and the same questions from different methodological and theoretical angles. The advantage is the extent of coherence between the individual component studies, the disadvantage would be the demand on resources. In all events, several researchers would need to cooperate, each with expertise in a particular method. Less complex from an organizational point of view, although often less coherent, is a number of separate studies covering the same subject area but using different methods. This has been done, for example, in the case of cultivation effects of talk shows by Davis and Mares (1998), in a cross-sectional survey, and by Rössler and Brosius (2001a) in a sequential experiment. Here, the interaction of analyses of content, surveys, in-depth interviews and even various forms of experiment provides a well-rounded picture of the possible cultivation effects of television. This is a longer-term route, requiring persistence and a willingness to cooperate with others. It is a route that must be traveled, however, if the possibilities afforded by a theoretical approach are to be properly exploited.

Notes

1. We realize that Gerbner and his colleagues explicitly *do not* define cultivation as a cause-and-effect relationship in which television is the cause and perception of reality the effect: “Our use of the term cultivation for television’s contributions of social reality is not simply a fancier word for effects” (Gerbner, Gross, Morgan, and Signorielli, 1986: 23). Rather, the description ‘cultivation’ denotes a complex interaction in which demographic, social, individual and cultural factors determine the form, content and extent of the influence of television, while at the same time underlying the cultivation process: “The interaction is a continuous process (as is cultivation) taking place at every stage, from cradle to grave” (Gerbner, Gross, Morgan, and Signorielli, 1986: 23). Just as with the dynamic-transactionalist approach, however, the problem that arises here is that the posited fluctuating interactions are even harder to determine than direct causal relationships (see for example Brosius, Staab, and Gassner (1991) on the problems of measuring dynamic-transactional relationships).
2. We subscribe here to Gurevitch and Levy’s (1986) idea of ‘meta-messages’. According to this admittedly broadly developed concept, the decoding of media messages is shaped by the public’s assumptions about their ‘latent meanings’. Recipients, like program makers, have certain ideas, which are not explicitly stated, that guide their processing of media messages. According to Gurevitch and Levy, these ideas play a central role in understanding what people know or learn from the media. The closeness of ‘meta-messages’ to schema theory or the notion of framing is obvious, although the authors do not address this in the context of the study cited.
3. Numerous studies have addressed the theoretical and empirical implications of the selective viewer, establishing stronger *cultivation effects from program-specific than*

from content across programs (see for example Hawkins and Pingree, 1981; Potter and Chang, 1990; Potter, 1990; Cohen and Weimann, 2000).

4. Even if one assumes that cultivation effects result from measurement artifacts, because questions generally tend to be framed in ways that induce heuristic judgments (e. g., “Please don’t think too long about the answer ...”, “I’m interested in your spontaneous answers ...”), the findings still have validity, since we do make many of our decisions heuristically (see Brosius, 1995).
5. However, the authors did not repeat measurements before and after the introduction of television.
6. Potter’s (1991) example shows that even here the causal relationship is not necessarily in the direction that initially seems logical. It is plausible that frequent viewing leads people to underestimate the proportion of women in senior positions, and as a consequence, to tend to think that women are basically less qualified than men, so that the attitude results from the perceived represented frequency. It is almost more logical to suppose that people who view women as less qualified underestimate the proportion in senior positions on the basis of their preconceived opinions.

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