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ABSTRACT

The TV viewing situation involves an active transaction between the child, the TV, and the TV viewing environment. The TV viewing transaction is a blend of passive and active cognitive activities. Children begin to watch TV systematically at around 2 1/2 years of age because at that time they have the cognitive ability to aappreciate the meaning of the dynamic flow of images and sounds TV presents. Evidence exists that preschool children look at the parts of a television program that are understandable, and that they engage in alternate activities such as toy play when the program momentarily is not understood. Preschoolers also use their peers' behaviors as cues for directing their visual attention in the TV viewing environment. One passive aspect of TV viewing may be called "attentional inertia": the longer a TV viewer continuously maintains visual attention to the television, the more probable it is that he or she will continue to do so. Although in general the young child stops attending to incomprehensible program material, attentional inertia may occasionally lead the child to new cognitive discoveries. TV viewing in young children is not simply the mesmerizing passively receptive activity it is represented to be in popular books. Directions for further research are suggested. (Author/RH)

Active and Passive Processes in Children's Television Viewing

by

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This paper was presented as part of a symposium on children's processing of information from television, American Psychological Association annual meeting, New York, September, 1979. The research discussed here was supported by funds from the National Science Foundation, the W. T. Grant Foundation, Children's Television Workshop through a contract with the U.S. Office of Education, and by a Research Scientist Development Award to D. R. A, from the National Institute of Mental Health.

Public and professional concern about the impact of television on children has begun to shift from the effects of television content, such as violence, to the effects of watching television, per se. This concern has expressed itself in almost daily public comments about the massive amount of children's television viewing and its possibly negative impact. These comments, ranging from the thoughtful to the ludicrous, are all duly reported in the popular press.

The concern stems from the belief that television viewing is an essentially passive receptive cognitive activity. The television stimulus is likened to a pulsating, stroboscopic succession of images presented to a viewer who is "little more than a vessel of reception" such that there is "no cognition, no discernment, no notations upon the experience one is having" (Mander, 1978).

At best television viewing is considered to be a waste of time and at worst it is thought to be fundamentally inimical to normal cognitive and social development, leading to a nonreflective, hyperactive child with a short attention span. The absence of systematic research into the nature of television viewing has until recently left these assumptions and assertions unquestioned and untested.

As evidenced by the present symposium, a number of researchers have begun to investigate the fundamental nature of television viewing by young children. My own experience of watching children watch television began six years ago. Initially caught up in developing methodologies for studying a complex behavior in the context of a complex, dynamic, stimulus environment, I did not question the assumption of television viewing as a passive, stimulus-bound activity. Since then, however, the children have taught me otherwise. Rather than seeing the child as being "controlled" by the television stimulus, I have come to see the TV viewing situation as involving an active trans-

action between the child, the TV, and the TV viewing environment.

This transaction involves a sophisticated blend of passive and active cognitive activities. Today, as a sort of practice session for a review paper I am planning to write, I would like to present you with a series of findings and arguments from my own and others' research in support of this point of view. When I refer to my own research, it should be understood that the research was developed and executed with the able assistance of my students and research assistants: Steve Levin, Betty Lorch, Jeanne Sanders, Robin Smith, Diane Field, and Rex Bradford.

One of the first of our findings that began to alert us to the importance of the child's active cognitive involvement with television was our observation that most children do not begin systematic TV viewing until about 2½ years of age. This was first reported in a survey of parents by Schramm, Lyle & Parker (1961) in the late 1950's, and was later verified in our laboratory by actual observation of young children's TV viewing behavior (Anderson & Levin, 1976). Although even infants will look at television to some extent, as was recently reported by Hollenbeck & Slaby (1978), we found that visual attention increases dramatically from one to four years of age, as shown in the first slide. At 2½ years of age, we found a sharp increase in the frequency of looking at the TV, as shown in the next slide. Qualitatively, we observed that "younger than 30 months, children did not systematically monitor the TV screen but rather had their attention 'captured' for short periods of time. The younger children appeared to be far more interested in playing with toys and interacting with their mothers than watching television. Older children, on the other hand, appeared to more deliberately 'watch' television: they sat oriented toward the TV often playing with toys, but glancing up at the screen frequently" (Anderson & Levin, 1976, p. 810). The

next two slides clearly illustrate a 4-year-old dividing visual attention between TV and toy play.

I am making the argument today that children begin to systematically watch TV at around 2½ years because it is at that time that they have the cognitive ability to begin to appreciate the meaning of the dynamic flow of images and sounds of television. Young children, rather than being passively controlled by the formal dynamic features of television, try to understand them. If the children do not understand a TV program at some level appropriate to their cognitive development, they do not watch it.

I would like to further bolster this argument that young children's understanding of television is a major determinant of their visual attention. In a study which will be published in the next issue of Child Development, we found that doubling preschoolers' visual attention to a TV program did not affect their comprehension of that program. Nevertheless, we found that those parts of the program that were best comprehended received the highest attention (Lorch, Anderson & Levin, in press). This pattern of results is consistent with the notion that the primary causal relationship is from comprehension to visual attention. We suggest that preschoolers struggle to understand their world, including television. That part of television which is understandable, is that part to which they attend. In subsequent studies we verified this principal by showing that preschoolers attend more to parts of Sesame Street in which the dialogue is concrete than otherwise (Anderson, Lorch, Field & Sanders, Note 1). This effect was also found independently by Krull & Husson (1979). We also showed that preschoolers attended less to Sesame Street when the dialogue was in a foreign language or was backwards, (Anderson, et al., Note 1) as shown in the next slide. All of these findings provide further support to the principal that the preschool child pays

attention to television when it is understandable. Children are not mesmerized by the dynamics of well produced television such that they stare at the screen regardless of content, despite allegations to the contrary by writers such as Marie Winn (1977), Jerry Mander (1978), Harvey Lesser (1977), Jerome and Dorothy Singer (1979), and Werner Halpern (1975).

We now have good evidence that preschool children look at the parts of a television program that are understandable and engage in alternative activities such as toy play when the program is momentarily not understandable. The question arises as to how the children are able to know when to pay full attention to the TV program. We suggest that when a child is engaged in an activity such as toy play, he or she monitors the audio at a largely non-semantic level of attention. That is, the child listens for certain auditory attributes which signal a change in the ongoing content or which signal that the material is probably understandable. Let me give you some examples. We have found that audio attributes which elicit visual attention from otherwise inattentive preschoolers include children's voices, peculiar voices, women's voices, sound effects, applause, laughter, and qualitative auditory changes from one sound source to another. Adult male voices, on the other hand, reliably inhibit attention to the TV (Alwitt, Anderson, Lorch & Levin, Note 2). Each of the audio attributes which elicit visual attention, we submit, is predictive either of content change or of child oriented, concrete and comprehensible content, when considered across a wide variety of TV programming. The consistently negative, inhibitory attribute, adult male voice, is ubiquitous on television and may, on the whole, be predictive of content that is not meant for children. Men's voices are probably far more predictive of abstract, adult oriented topics than are women's voices, children's voices, or peculiar voices. We suggest that young children learn these valences as part of the process of becoming active, selective TV viewers.

This learning about the attributes of television, we suggest, is on a continuum with learning the attributes of social interactions. Researchers such as Duncan & Fisk (1978) have shown that people are highly sensitive to nonverbal behaviors which indicate when, for example, one should take his or her turn in an ongoing dialogue. In a recent study we have shown that preschool children are also highly sensitive to the behaviors of their peers in a TV viewing situation. Rather than their TV viewing behavior being totally "controlled" by the TV set, we found instead that preschoolers use their peers' behaviors as cues for directing their visual attention in the TV viewing environment.

We studied the influence of peer presence on preschoolers' TV viewing behavior by having 3- and 5-year-old children watch TV in groups of 1, 2, or 3 viewers. The viewing room also contained an audiovisual distractor which presented a new slide accompanied by a "beep" every 8.0 seconds. Beyond the overall result that visual attention to the TV decreased with increasing group size, we found that when one of a pair of children looked at the TV, looked away, looked at the distractor, or showed some kind of overt involvement with the TV program, such as laughing or talking about it, the other child tended to do the same thing at the same time. By comparing children who did and did not watch in the same groups together, we were able to show that this effect of peer presence occurs above and beyond the mutual organizing influence of the TV program itself. In further analyses, we showed that the children's influence on each other was mutual: there was little evidence that one child tended to consistently "lead" the other child in TV viewing activities. If we examine the organizing influence of the TV, ignoring whether or not the children viewed together, we also find that 5-year-olds are in general more likely to look at the TV at the same time than are 3-year-olds.

This greater coherence of 5-year-old behavior reflects, we suggest, their greater learning of the informative attributes of television -- they know better than 3-year-olds the characteristics of the medium which are useful in guiding attention (Anderson, Lorch, Smith, Bradford, & Levin, Note 3). In summary, our findings suggest that while watching TV, children are in fact sensitive to their social environment and use their peers' information processing behaviors as cues to direct their own behaviors. The total pattern of results suggests that the processes underlying this social sensitivity are similar to the processes underlying the children's ability to actively and selectively pay attention to television.

Although I can cite more examples of the active strategic nature of TV viewing, it is perhaps important to discuss a passive aspect of TV viewing. One such passive factor is a phenomenon which we call "attentional inertia" (Anderson, Alwitt, Lorch & Levin, in press). The longer a TV viewer continuously maintains visual attention to the television, the more probable it is that he or she will continue to do so, as shown in the next slide. Curiously, if we examine the nonlooking pauses, those spaces between looks at the TV, we find an analogous phenomenon. A plot of the probability of looking back at the TV as a function of time since the end of the last look, gives us the curve shown in the next slide. The longer a nonlooking pause is maintained, the less probable it is that the child will look back at the TV. This curve, by the way, is not a necessary mathematical consequence of the fact that the curve for maintaining a look at the TV is an increasing function. The attentional inertia phenomena characterize individual data from both child and adult TV viewers as shown in the next two slides. The phenomenon, therefore, is not an artifact of averaging over individuals, nor is it restricted to children. In further analyses we have shown that attentional

inertia to television is not due alone to progressively increasing, ongoing involvement with specific TV content. We demonstrated this by analyzing preschoolers' visual attention to Sesame Street. Sesame Street is constructed by stringing together about 40 more or less independent segments or "bits" to make up the entire program. Importantly for present purposes, when one bit ends and another one begins, there is an abrupt change of content both perceptually and conceptually. As an example, an animated bit concerning multiple classification of objects might be followed by a film about buffaloes. These frequent bit boundaries provide ideal points at which to determine whether attentional inertia represents involvement with specific content. Consider looks at the TV which are in progress at the time the bit boundary occurs. If attentional inertia represents involvement with specific content, then there should be no relationship between the amount of time the look was in progress prior to the bit boundary and the length of time it remains in progress after the bit boundary. If, on the other hand, attentional inertia represents an attentional arousal that is to some extent free of content, then there should be a positive relationship between look length prior to the bit boundary and look length after the bit boundary. The next slide presents the average results for data taken from 300 preschool children each of whom watched one hour of Sesame Street. As you can see, there is an increasing function as predicted by the notion that attentional inertia is content-free attentional arousal. The longer a look at the TV has been continuously in progress, the greater the tendency for the look to be "driven" across content boundaries. In further research, which time limitations do not permit me to describe here, we have found that the attentional inertia function also represents a growth of selective attention to the TV -- the longer a child continuously maintains attention to the television, the less distractible the child becomes.

Since attentional inertia to television is observed in children as young as a year of age, and since it is not bound to specific content, we believe that it is not a voluntary, strategic aspect of attention. Nor do we believe that this reliable aspect of attention evolved in the 30 years since children began watching TV. Rather, we have begun to see attentional inertia as being the conceptual opposite of habituation. If habituation is the attentional response to a repetitive, meaningless, static stimulus, then attentional inertia is the attentional response to a somewhat unpredictable, meaningful, dynamic stimulus. Attentional inertia, we believe, provides the means by which attention is maintained to a source of information even across breaks in the continuity of that information. Rather than the TV viewing child being a victim of attentional inertia, we see it as an essential weapon in the child's cognitive arsenal. Attentional inertia is what allows the child to keep processing a stimulus even when it is currently not understandable. Attentional inertia thus sometimes produces a dynamic tension with program comprehensibility: although in general the young child stops paying attention when the program becomes incomprehensible, attentional inertia serves to maintain attention further than it might otherwise go. As such, attentional inertia may be part of the means by which the child comes to process a stimulus that is poorly understood. This enforced, nonstrategic, attention may thus occasionally provide the child the means by which he or she ventures into unknown cognitive territory, occasionally leading, for the child, to new cognitive discoveries.

Our conception of young children's TV viewing is of a cognitively active learned behavior sensibly intermeshed with relatively passive unlearned cognitive processes. We see television viewing as a cyclic transactional

information processing activity. This transaction involves multiple interactions over time between the TV viewer, the TV viewing environment, and the television program itself. The simplicity and complexity of this transaction is represented in the next slide which shows some of the multiple active and passive factors which lead a child to initiate a look at the TV, maintain a look, look away, and maintain a non-TV viewing pause. Our research and that of others, shows that TV viewing in young children is not simply the mesmerising passively receptive activity as it is so popularly represented in books such as the Plug-In Drug. Rather, it is probably representative of the active, growing and selective cognitive activity that the child brings to many everyday situations.

Before ending this too brief exposition of our ideas about TV viewing, I would like to close with some cautions and some questions. Because television viewing is not as mysterious and dangerous an activity as many would have us believe, we cannot thereby ignore it as a potent factor in children's social and cognitive development. Even though the young child may learn to be an active, skilled, and selective processor of television, we must still be concerned about the content of that television stimulus. If I can borrow an idea from computer programmers, it does not matter how sophisticated your data analysis programs are, if the data themselves are worthless -- "garbage in, garbage out." I believe that the case can be well made that much of the content of television is in fact garbage.

Beyond the issues of content there are many important questions about TV viewing which have hardly been examined, much less answered. For example, more research needs to be done on the effects of television program pacing on cognitive development. Several educators, psychologists and pediatricians, most notably Jerome and Dorothy Singer, are convinced that rapidly paced

television which incorporates sophisticated editing procedures is harmful to children, making them impulsive, hyperactive, with shortened attention spans. My own attempt to verify such a profound effect of TV viewing (Anderson, Levin & Lorch, 1977) was fruitless, and the published attempts of other researchers, I would argue, are seriously flawed methodologically. My present intuition is that no such effect of rapid television pacing exists, and I cannot imagine what the underlying mechanism for such an effect would be. Nevertheless, the public accusations against rapidly paced TV appear almost daily, and must be either supported or finally refuted by well designed and responsible research efforts.

Another issue future research should deal with is automaticity of cognitive processing in the sense discussed by Schiffrin & Schneider (1977). Even though we argue that TV viewing is an active, learned, and selective cognitive activity in young children, it may become an overlearned, automatic cognitive activity in adults. As such, it is possible that, given the commercial propensity for least common denominator programming, that TV viewing in the older child and adult is in fact largely a waste of time and mentally stultifying. Gavriel Salomon (1979) raised this idea in his recent book and it bears research examination. Certainly the idea of TV viewing as stupifying and time-wasting corresponds to the intuitions of many educated people.

A final and perhaps related issue concerns the oft-mentioned television addict. To my knowledge there has been no research attempt to determine whether television addiction truly exists, and if so, to understand it.

In carrying out such research, however, I would caution against presuming the existence of such a phenomenon or attributing its cause to television alone. Television viewing may be a consequence of the structure of American society and the behavioral options it provides as much as it is a consequence of the structure of television itself.

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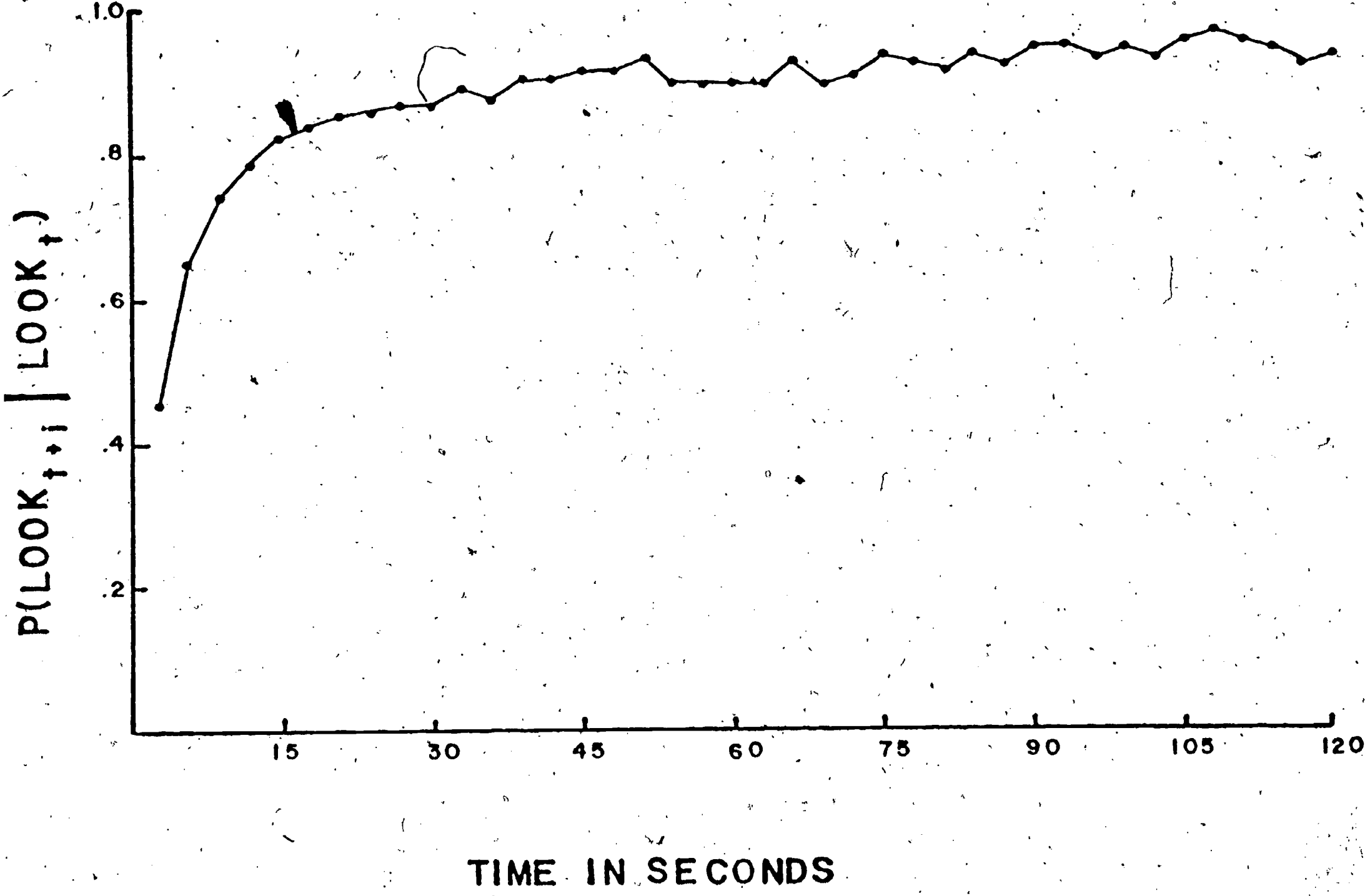
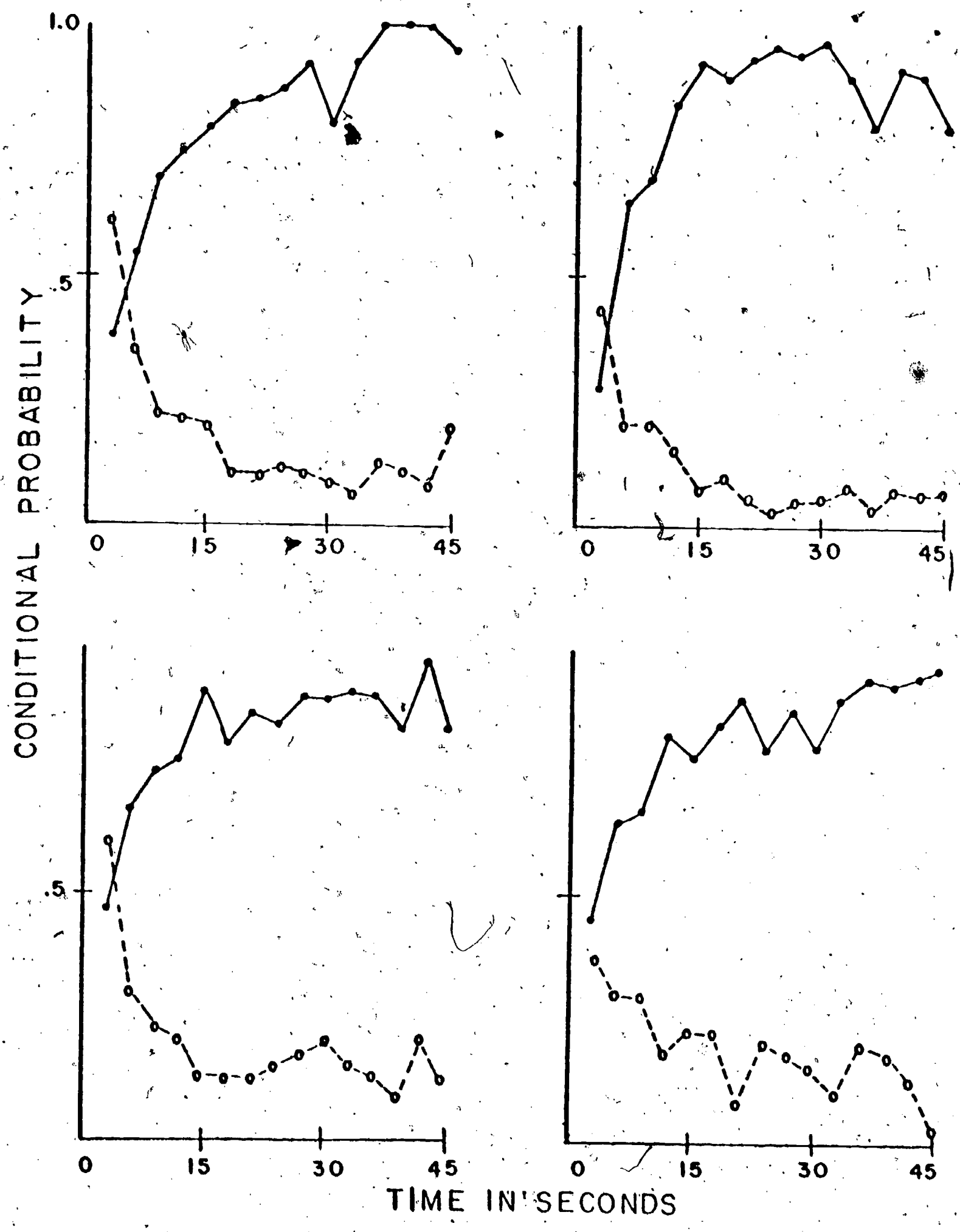
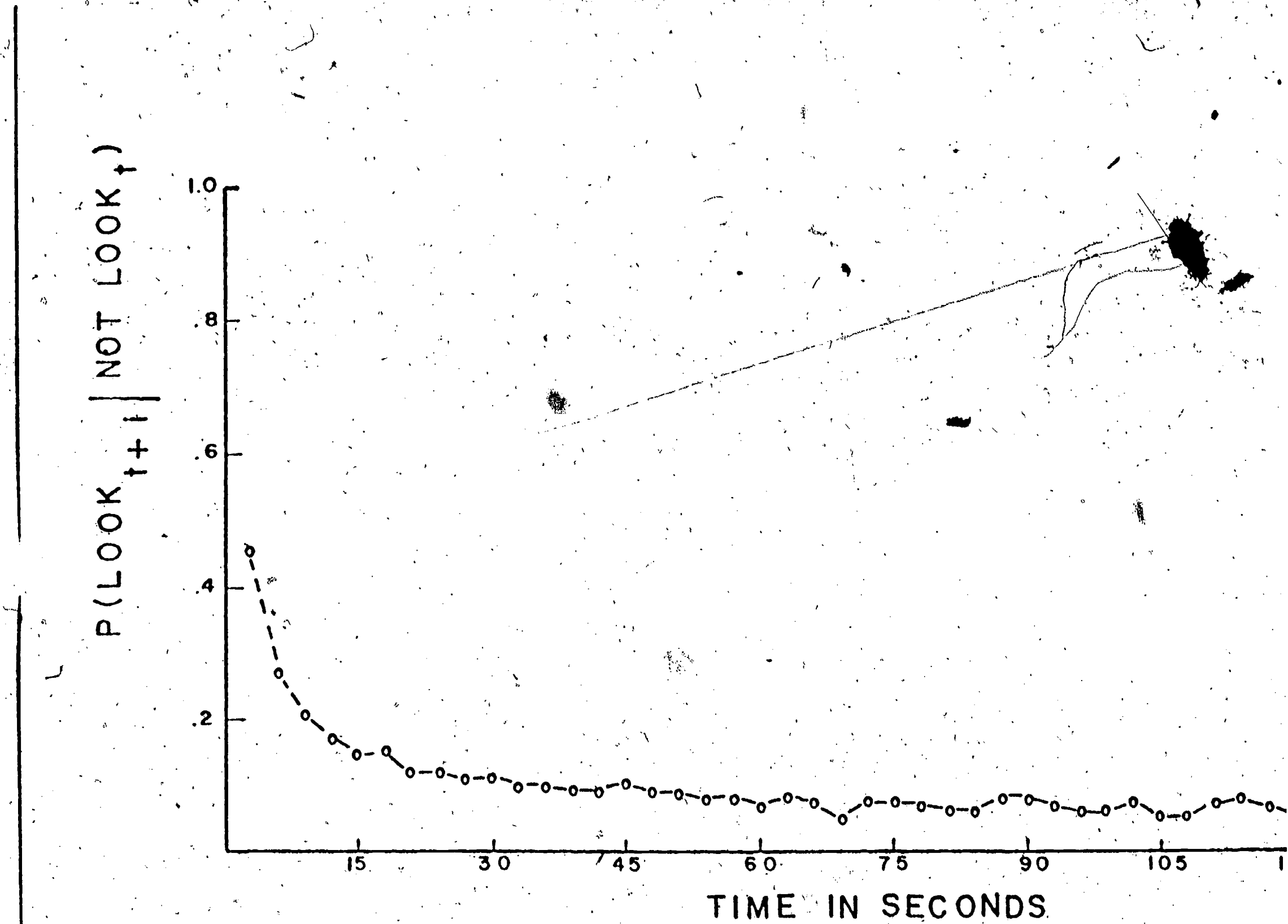

1.0
.8
.6
.4
.2
P(LOOK t+i | LOOK t)
15
30
45
60
75
90
105
120
TIME IN SECONDS


1.0
.5
0
15
30
45
CONDITIONAL PROBABILITY
TIME IN SECONDS


P(LOOK t+1 | NOT LOOK t)
1.0
.8
.6
.4
.2
15
30
45
60
75
90
105
TIME IN SECONDS

(a)

(b)

(c)

(d)

(e)

(f)

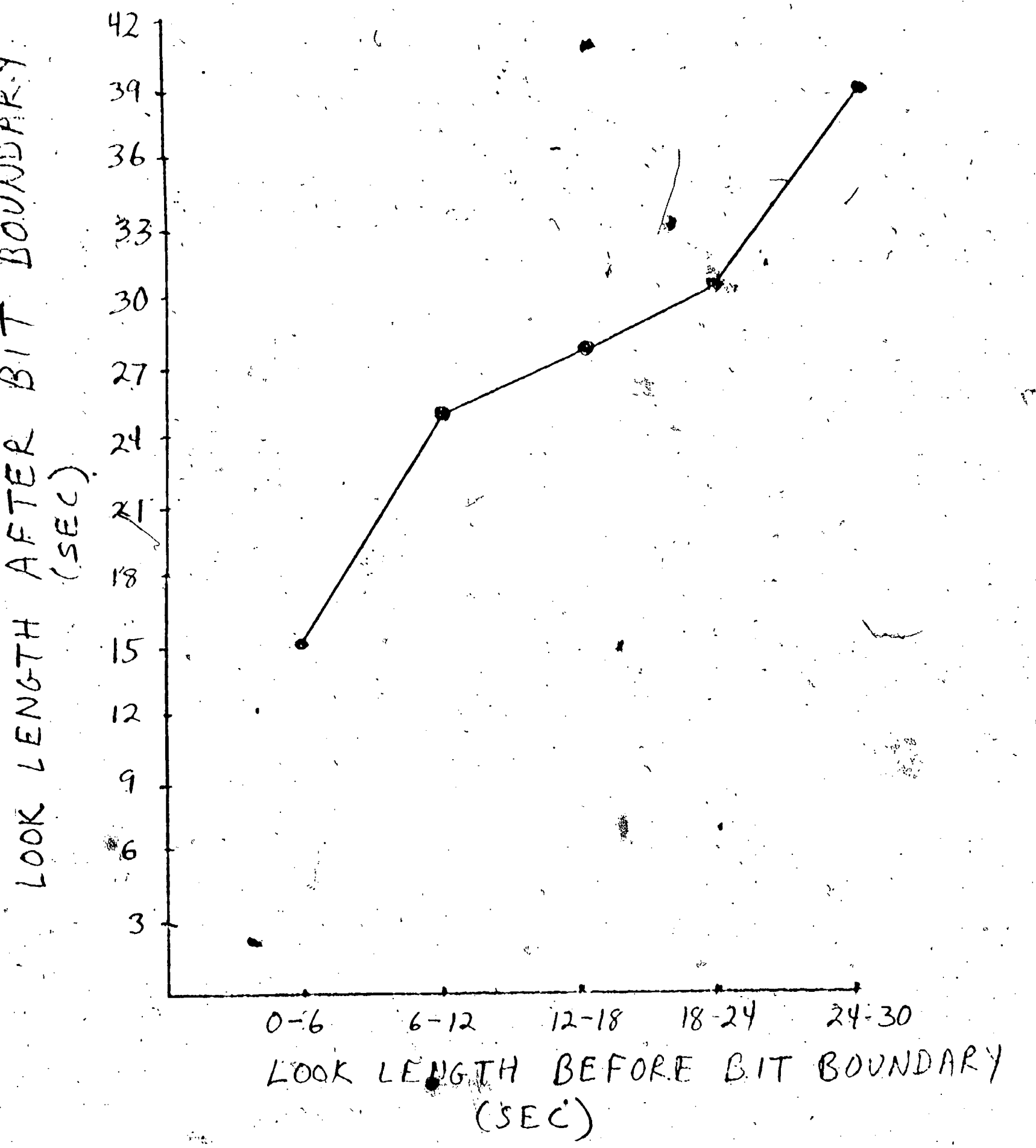
Conditional Probability

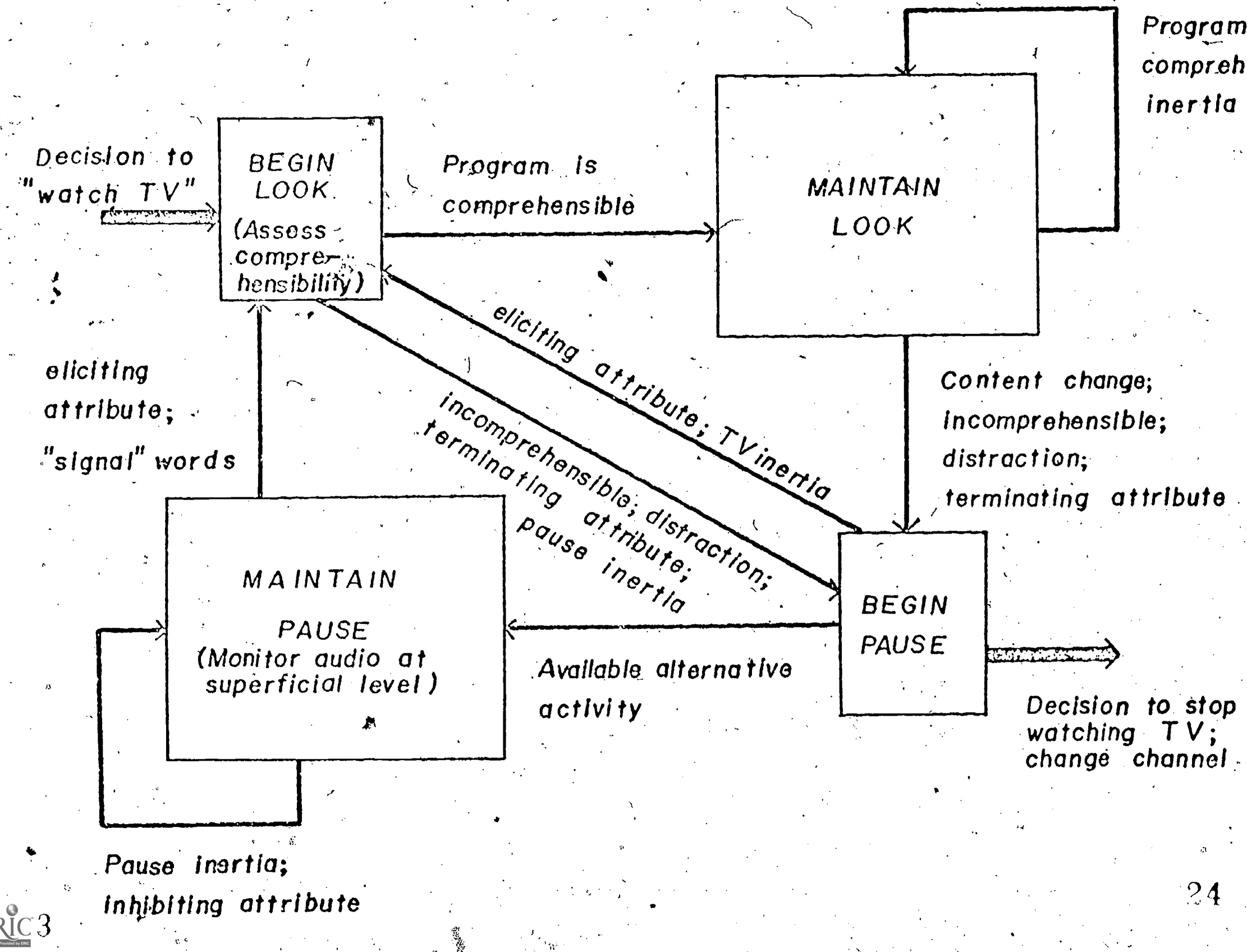
1.0
.8
.6
.4
.2

0
15
30
45

Time (Sec)

FIGURE 2


LOOK LENGTH AFTER BIT BOUNDARY (SEC)
42
39
36
33
30
27
24
21
18
15
12
9
6
3
0-6
6-12
12-18
18-24
24-30
LOOK LENGTH BEFORE BIT BOUNDARY (SEC)


Decision to "watch TV"
BEGIN LOOK
(Assess comprehensibility)
Program is comprehensible
MAINTAIN LOOK
Program is comprehensi
inertia
eliciting attribute; TV inertia
Content change; incomprehensible; distraction; terminating attribute
eliciting attribute; "signal" words
incomprehensible; distraction; terminating attribute; pause inertia
MAINTAIN PAUSE
(Monitor audio at superficial level)
BEGIN PAUSE
Available alternative activity
Decision to stop watching TV; change channel
Pause inertia; inhibiting attribute