

COGNITIVE IMPACT OF THE MEDIA: IMPLICATIONS FOR A PLURALISTIC SOCIETY*

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ABSTRACT

The theme of this article is that television (TV) has a democratizing influence in our pluralistic society. The source of this influence is that groups who are disadvantaged in terms of print media and print-oriented schooling are advantaged in terms of access to and attitudes toward TV. Research results indicate that, by and large, various class and ethnic groups are equal in their ability to learn from TV – whose power as a teaching tool is discussed in relation to transmission of school-oriented concepts like letters and numbers, story content, and beliefs about society. The potential value of TV in the schools – not to replace print, but to enhance it – is also discussed.

In considering the cognitive impact of the media, we can identify two potential sources of impact: one is the form of a medium and the other is its content. Under form, the discussion will be limited to the influence of form on cognitive processes. Under content, two areas, both of which have particular implications in a pluralistic society, will be covered. One area is the acquisition of knowledge and the other is the view of social reality. In addition, I shall consider how cognitive impact is moderated by social interaction and by cognitive development.

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THE IMPACT OF FORM ON COGNITIVE PROCESSES

The starting point for this topic is the concept of literacy in a particular medium. In 1964, Marshall McLuhan made a famous and, at that time, revolutionary statement that the medium is the message [1]. Among other comparisons, he suggested that TV and print contain fundamentally different codes of representation. He also pointed out that, during its early years, a new medium of communication characteristically conveys the content of older, entrenched media. Thus, movies at first presented a celluloid version of theater. Radio initially carried vaudeville shows, and TV was for some years a visual version of radio. Howard Gardner has recently pointed out that, when researchers first turned their attention to studying TV, the same trends emerged: researchers studied characteristics that TV shared with other media [2]. Specifically, they studied the effects of content, violent content in particular. This early wave of TV research proved insensitive to the special formal qualities of TV. However, the content of TV is not at all unique to the medium, while its form is. As Rice, Houston, and Wright, a major group of cognitive TV researchers, point out, TV is a visual medium in which "a stream of constantly changing images can be generated by techniques that are not replicated in real world experience." [3] These are the characteristics that are unique to the medium. As these authors observe, some are visual, generated by techniques such as camera cuts, pans across scenes, camera zooms in and out, slow motion, fast motion. Others are audio, for example, faceless narrators and canned laughter. But these are not merely visual or verbal techniques; they are also, and most interestingly, forms of symbolic representation [3]. They are forms of symbolic representation because each technique makes reference to some aspect of real world entities and real world events. For example, when a camera zooms in, this communicates a relationship between some detail and its larger context. A simple cut usually means a change of perspective on a given scene. A dissolve, in contrast, signifies a change of scene or, at least, time. In terms of audio techniques and their symbolic significance, a faceless narrator often means that the person narrating is not a person who is involved in the scene. Such symbolic conventions as these, taken as an ensemble, form a code. Henceforth, I will use the term TV literacy (based on Salomon [4]), to refer to knowledge of this code. An important aspect, therefore, of the cognitive impact of TV is the acquisition of TV literacy.

The Acquisition of Television Literacy

It is very difficult to separate out the effects of maturation, general experience, and specific TV experience in explaining and understanding the acquisition of TV literacy skills. What is known, however, is that, in the United States, these skills are more developed in older than in younger children [5].

Gavriel Salomon, a pioneer in the exploration of TV literacy, has, by working in a country with much less TV than the United States, been able to ascertain to

some extent the specific impact of TV experience in the cultivation of these TV literacy skills [4]. In a sense, this work tests the very idea of TV literacy: Is it meaningful to talk of TV literacy, as something acquired by experience with the medium itself?

Salomon was able to research the effects of the introduction of *Sesame Street* to Israel in 1971. At that time, Israel was what he called TV naive — there was only one black-and-white channel which had been introduced three years earlier, and this one channel broadcast for only four hours a night. Of these four hours, only one-half hour was actually children's programming. He points out that not only was there quantitatively little TV, but what there was was qualitatively quite different from *Sesame Street*. In other words, the style of *Sesame Street*, based on the kaleidoscope format of American commercials, was totally novel in the Israeli context. In contrast, the content of *Sesame Street* was not novel, being mainly things that are learned in a preschool environment to which most Israeli children are exposed.

As well as examining the impact of *Sesame Street* on the acquisition of specific knowledge, as was done in the United States [6], Salomon used five tests that did not measure any content taught directly by the program [4]. Instead, these tests measured a set of skills related to the program's special code of symbolic representation. Here are some examples of the kinds of tests he used. In one, called a test of changing points of view, a subject saw a scene involving several people and some objects and then was asked to select, from a set of seven possible alternatives, another picture that shows how a particular person in this scene would see a particular object. Success at this task involves understanding a shift in visual point of view and being able to imagine a point of view different from one's own. Another test of TV literacy was called the close-up test. Here the subject had to identify, from an array of photographs, the long-shot of an object that was shown enlarged. Salomon had twelve groups in his study. There were three different age levels — preschool, second grade, and third grade — and each age level was divided into a middle class and a working-class group. Each of these six groups was then divided into heavy and light viewers. For present purposes, the important point is the contrast between the heavy and the light viewers. Among the preschool children there was no difference as a function of amount of viewing. However, among the older children (second and third graders), heavy viewers did significantly better on all tests; this result held for both middle class and working-class subjects. In other words, heavy viewers were acquiring TV literacy skills, such as understanding the meaning of a closeup, more so than light viewers were, and, importantly for the theme of this article, this was occurring across social classes. The important point about these results is that they show that the development of TV literacy skills is cultivated by exposure to the medium itself. On the other hand, the absence of the effect of heavy viewing in the younger children makes a second point: that there is some kind of prerequisite to the cultivation of TV literacy

skills. This prerequisite could be either level of maturation, prior experience, or both. In any case, the results indicate that viewing does not have an immediate impact on the younger children as far as the measured literacy skills are concerned.

Salomon was also able to show the positive influence of these TV literacy skills on the acquisition of cognitive content, another aspect of cognitive impact. Cognitive content in the *Sesame Street* context means learning numbers, letters and so forth, the content actually emphasized and taught by the show. Through cross-lag panel analysis, Salomon demonstrated that the TV literacy skills he had measured were positively related to the acquisition of cognitive content taught by the program at a later point in time. There was a time lag such that, if a child acquired TV literacy skills at one point, this enhanced the child's learning of cognitive content at a later point in time. However, Salomon did not find the opposite effect, that is to say, he did not find that learning cognitive content influenced the later acquisition of literacy skills.

The body of research just discussed implicates a set of skills that has to do with a code specific to the medium of TV, skills which are developed through exposure to that medium, given a certain prerequisite developmental level. This set of skills then leads to learning cognitive content from the medium. Hence, we find an interrelation of form with content. It appears that, through exposure to the medium, one learns the meaning of certain forms and knowledge of these forms then helps in acquiring the content which they transmit.

Learning TV Content among Different Groups in the United States: TV as a Democratic Medium

Applying these findings to our own society, I shall start with the fact that TV literacy skills seem, from Salomon's results, to be developed through simple exposure to the medium itself. One can then ask about the amount of TV watched by different subgroups within our pluralistic society, and the consequences of different amounts of TV exposure in different groups for TV literacy skills, and, ultimately, the ability to learn content from TV.

I shall focus on two dimensions of social contrast which have been involved in the work of my own research group [7]. These are the contrasts between middle class and working-class and between black and white. What are the viewing habits of these groups? According to a 1979 article in the *Journal of Communication* [8], there has been a consistent finding over the years of an inverse relationship between socio-economic status and TV viewing and attitudes. That is to say, people of lower socio-economic status tend to use TV more and be more favorable toward it than people of higher socio-economic status. In terms of the black-white contrast, blacks are heavier viewers than whites at any given level of socio-economic status. This black-white ethnic difference in viewing applies not only to adults but also to children.

Perhaps even more interesting than group differences in viewing habits are group differences in motives. A number of studies show that people of lower socio-economic status more often cite learning as a motive for watching TV than do people of higher socio-economic status. In addition to the class difference, there is also an ethnic difference in motivation. Black people of lower socio-economic status cite learning as a motive for TV more frequently than do white people at a comparable socio-economic level, and this holds in both elementary school and high school samples. From these group differences, an important set of questions follows: Are these differential viewing patterns and attitudes reflected in TV literacy skills? If so, do these skills allow working-class and black children to extract information from TV better than white children? In other words, the argument goes as follows: If working-class and black groups watch more TV than middle class white groups and if exposure to TV cultivates these literacy skills, then perhaps these groups are acquiring greater literacy skills and therefore learning more from TV.

Our own research provides some preliminary answers to these questions. This research involves four different groups: middle class white children, middle class black children, working-class white children, working-class black children. Each of these groups was shown an animated, narrated story on a TV monitor, a technique based on Meringoff [9]. The children ranged in age from six and one-half to ten and one-half years. One skill that was tested was the verbal recall of the televised story that had just been seen.

Although our preliminary results [10] led us to believe that recall differences would mirror exposure differences among the ethnic and class groups, this did not turn out to be the case [7].¹ What did occur for verbal recall was a pattern of no class or ethnic differences. If recall is a function of medium literacy, then such literacy is clearly affected by more than simply amount of exposure (as it was also in Salomon's study). Nevertheless, these results have social significance because they indicate that the advantages generally possessed by middle class and white children on cognitive tests can be compensated by working-class and black children's greater exposure to the medium on which the test is based. Lest it be thought that this absence of class or ethnic differences be a function of a too easy test, it should be pointed out that the same recall measures that yielded neither class nor ethnic differences did yield statistically significant age differences in favor of the older children. In other words, the test was hard enough that younger children performed less well than older children on it. This pattern of significant age differences in the absence of class and ethnic differences held for the overall memory measure, total number of words, as well as for a number of more specific measures: number of specific characters recalled, amount of direct dialogue recalled, and number of locations recalled [7].

¹ Our evidence on exposure is based on demographic data from a number of studies. We do not have exposure data on our particular samples of children.

While there were no class or ethnic differences on these verbal recall measures, there was a statistically significant ethnic difference on the visual recall measure. This test involved taking a group of still drawings (taken from the picture books on which the animated stories were based) and arranging time in the correct story sequence. As with the verbal measures, older children did better than younger, but here white children also did better than black. Again there were no class differences. While the latter result fits in with the theme of TV as a democratic medium, the former does not. However, in interpreting the ethnic difference, I think that it is necessary to consider that the drawings used in the test introduce still another medium, story book illustration, which could be less familiar to black children, on the average, than to white. Whether or not this explanation is correct, the dominant pattern of memory results consists of the *absence* of differences between different classes and ethnic groups.

This point leads into my major theme: that TV is an intrinsically democratic medium. It is democratic in that it, to some extent, removes the communicative advantage possessed by white middle class people in the world of schools and books. This is not, however, to say that TV can close a gap between classes and races that is produced by many, many different factors. For example, in the research on *Sesame Street*, there has been a debate about whether *Sesame Street* has really closed the gap between disadvantaged and advantaged children; and the conclusion was that it did not close this gap [11]. This is understandable, if not predictable. TV is not the only source of knowledge and skills, and advantaged children certainly had access to other sources that were not shared by disadvantaged children. However, what is important about the results of *Sesame Street* in the United States is that disadvantaged groups did learn what was taught on the show, and they learned more if they watched more [6]. In other words, learning was proportional to exposure. This is a lot more equality than we observe when we compare the same groups in their response to schools. A quote from Siegel makes the point very well [12, p. 18]: "American children spend more time watching TV than they spend in the classroom. We see few dropouts from the electronic school and very little TV truancy." Disadvantaged groups have, of course, relatively high dropout and truancy rates from school. This difference in the relative advantage of different groups as function of the medium becomes even clearer when we consider that, in terms of school performance, middle class children do consistently better than working-class children and white children do consistently better than black children. If we compare TV to print, the dominant medium of the schools, we see the same pattern of subgroup differences holding up. Middle class children read at higher levels than working-class children; white children read at higher levels than black children of similar socio-economic status. Such differences, in contrast, are quite minor in the results that have been presented concerning different groups' ability to learn from TV.

The point here is not, of course, that working-class and black children have a

lesser ability to learn from print or from print-oriented schools. Rather, it is that they have lesser opportunities for experience with the print medium and with school-like situations in the course of socialization, and so are at an environmentally produced disadvantage in reading and in print-oriented classrooms. In contrast, their backgrounds provide a potential advantage in learning from TV because of greater exposure and more favorable attitudes at home towards the medium.

The Possible Role of TV in the Schools

An obvious implication of these facts is that children from some of the less advantaged subgroups within our pluralistic society could do better in school if schools relied less on print, more on video as a medium of instruction.

There is also another argument that leads to advocating greater use of TV in the schools. The line of evidence begins with a finding from research on a number of programs: *Sesame Street* (both here and in Israel), *Electric Company* (designed to teach reading) and *Villa Alegre* (a program that aims specifically at Hispanic children). All of these programs have in common the fact that they are designed to promote education and learning among minority and disadvantaged children. The finding is that the effects of these programs on knowledge are stronger if there is mediation through interaction with an adult during the viewing process [13]. If there is an adult watching with the child, this person may encourage the child to pay attention and explain things that are incomprehensible. In fact, to a great extent the gap in knowledge acquisition between disadvantaged and advantaged children closes up under conditions where the disadvantaged children have an adult to mediate these educational TV programs. Now the powerful effect of adult mediation in learning has a practical and social implication: it suggests the systematic use of TV in school, for, in school, an adult is always available to mediate. *In school, adult mediation is called teaching*. The relatively recent availability of new technology for recording TV shows with the use of a timer makes it quite feasible to use broadcast TV during regular school hours. For the first time, broadcast TV can be fit into classroom time slots.

This idea of using TV more heavily in schools would aim not to eliminate but to democratize the print medium currently emphasized in our educational system. Relevant here is a study that shows that TV can enhance response to the more traditional school activity of reading. In 1960, Levinson reported an important experiment, one that has probably been much too much overlooked [14]. Levinson, working with junior high school students, looked at their response to short stories (written by authors like O'Henry) as a function of their medium of presentation. In one condition, students read the original story. In the other conditions, they were exposed to the same short story in two media, film and reading. In one of these conditions, subjects read first and saw the film second; in another, subjects saw the film first and read second. For present

purposes, the important aspect is the difference between just reading and film plus reading. (Here, McLuhan notwithstanding, I am considering film to be functionally equivalent to TV, for films are, of course, an important segment of TV fare.) In terms of response to these different conditions, Levinson investigated children's comprehension (which included recall) and enjoyment (assessed by their desire to read more stories of the same type). Overall, he found that the addition of the film very much augmented response to the story. This effect was particularly strong for subjects with lower IQ's. In other words, the children with lower IQ's were helped by the addition of the film more than were children with higher IQ's. The advantage added by the film was also greater, the more unfamiliar the story.

Perhaps most interesting, film stimulated not only comprehension and memory for the story, but also a desire to read more of the same type of story.² One important aspect of these results is that the effect of film on reading is greatest for just those children who tend to have more problems in school, that is, the low IQ group. But even more important, this study demonstrates the potential for using TV to enhance reading. Thus, this result shows us that, contrary to popular opinion, book and television need not be two media at war with each other.

The Role of TV in the Development of Visual Memory

There exists one more specific benefit of TV in terms of medium-related information processing, its effect on visual memory. In the discussion of our research above, a visual test of recall for our stories was mentioned in which we gave children pictures and asked them to arrange the pictures in the same order that they had occurred in the story. In other words, a subject had to retell the story using pictures. When we compared the effects of the two different media on this task, we found fewer errors after TV presentations, more errors following radio presentations. This effect held across all social classes and ethnic groups. Thus the cognitive impact of a medium on memory varies according to the degree of match between the medium of presentation and the medium of the test.

The Role of Radio in the Development of Imagination

These positive effects of the audiovisual media notwithstanding, there is a complaint about TV that has recently appeared frequently in the literature and

² This is not a perfectly controlled study from a strictly experimental point of view, because students in the "print-only" condition received only one exposure to the story, while students in the "print-plus-film" conditions received two. Hence, any differences in comprehension could be attributed to the extra exposure of the latter groups. However, from the point of view of ecological validity, this does not seem like a significant criticism because, in the real world of school, students do not read literature twice, nor would it be practical to expect them to do so.

even in the popular press [15–17]. The complaint is that there is one skill that is not only not promoted by TV, but is actually diminished by it; that skill is imagination. At this point, let us consider a second medium, radio, with its own distinctive code. In our project, mentioned above, children were exposed not only to TV versions of stories, but also to radio versions of the same stories. The two versions had identical sound tracks, and differed only in whether there were moving visuals present or not. Half the children participated in the memory study, selected results of which have already been presented. The other children participated in the imagination study. Again, children ranged in age from six and one-half to ten and one-half years and were composed of four different combinations of class and ethnicity: middle class white, working-class white, middle class black, and working-class black.

Our idea was that radio might stimulate imagination more than TV because radio, of course, leaves more to the imagination. We thus thought that TV's weakness could be radio's strength. We were particularly interested in finding a particular strength for radio because our research program was developed in connection with children's radio programming at Los Angeles station KPFK and the Pacifica Foundation, the umbrella organization for KPFK and four other noncommercial radio stations around the country.

We tested our hypothesis by developing a technique to assess imaginative response. The technique consisted of stopping each story before the end and asking a child to complete the story [7]. In some cases, the child had just seen the story in a simulated TV presentation; in other cases, he or she had just heard it in a simulated radio version. We scored these story completions for different kinds of novel elements that were not present in the original stimulus story: events, characters, and so forth. We called these scores imagination because novel elements, not present in the stimulus story, had to be mentally represented, that is, imagined, by the subjects. The statistical results confirmed our hypothesis. Radio stimulated more imaginative story completions than TV.

However, while this pattern held for both middle class and working-class children, overall, it did not hold for black children. Their imagination scores tended to be low and radio presentation did not augment them. On the other hand, results from the other (memory) study indicated that imaginal processes of black children were not less, but more active than those of white children. Black children elaborated significantly more in their free recall, going beyond the stimulus story, than did white children. Black children also used material from outside the story as a basis for answering inference questions more than white children did. Both these activities involve processes of mental representation that go beyond the immediate stimulus; essentially this is our definition of imagination. Thus, it seems likely that test instructions — perhaps giving the idea of a school-like structure rather than imaginative freedom — were responsible for the black children's low scores in the imaginative study. Furthermore, there was a positive effect of radio (versus TV) in promoting the use of out-of-story

material as a basis for answering inference questions, an effect that held for black children as well as white. Hence, it is quite possible that, where task instructions would be interpreted by black children to give permission for imagination, radio would stimulate their imagination, just as it does for white children.

Despite these complexities, one thing is quite clear: level of imagination, as assessed by our story completion measures, is not a simple negative function of how much a particular group watches TV: among the white sample, working-class children were significantly more imaginative than middle class, even though they are, in theory, the heavier TV viewers. Thus, while we have some evidence that radio can be used to augment imaginal processes in various subgroups, we do not have good evidence that sheer amount of TV viewing depressed this skill.

THE IMPACT OF TV ON THE CONSTRUCTION OF SOCIAL REALITY

This area will be covered in less detail than the preceding one. However, excellent reviews have been prepared by Dorr [18], Graves [13], Greenberg [19], and Hawkins and Pingree [20]. The overwhelming weight of these reviews supports the notion that TV does affect children's view of social reality. In a particularly interesting study, Buerkel-Rothfuss, Greenberg, and Nuendorf [21], looked at fifth, sixth, and eighth grade children, investigating association between TV and their images of family relationships. The researchers found that watching family dramas such as *The Waltons* was correlated with the belief that real-life families are cooperative, helpful, and sharing. On the other hand, watching shows that are about broken families or about teenagers was correlated with beliefs that real-life families are antagonistic, verbally aggressive, and punitive.

Stronger evidence of TV's causative role comes from the realm of sex-role learning. Studies indicate that, as early as age three, heavy TV viewers have more stereotyped views of sex roles than do light viewers [22]. This finding indicates that children simply learn what is actually presented on TV—sex role stereotypes. Indeed, content analysis of TV programming has confirmed that TV generally presents highly stereotyped views of males and, particularly, female roles [19].

On the other hand, TV is so powerful as a medium that it can also be used to break social stereotypes, not necessarily from a single exposure but over the long haul. A study by Miller and Reeves demonstrates this possibility [22]. These researchers searched for some characters on TV that ran counter to sex role stereotypes for female occupations. They found five such characters on series, including a female police officer and a female park ranger. They then interviewed children, separating them into two groups, one that could identify the character and the occupation and one that could not. Presumably if a child can identify a character and her occupation, he or she has been watching the TV program, most likely over a period of time. The results showed that children who could

identify the character and the character's occupation were more likely to see that that occupation as appropriate for women than were children who were not familiar with the character.

This study has important implications for a pluralistic society because it shows that TV can be used to break stereotyped thinking about different groups, sexual, ethnic, and class, as well as being used to perpetuate stereotypes, unfortunately most often the case with the current state of network programming. This study indicates the potential, thus far exploited only to a very limited degree, for using TV to help children build a more pluralistic image of society.

THE IMPACT OF TV ON THE IMAGE AND SELF-IMAGE OF MINORITY GROUPS

Several studies have shown that TV can be used to enhance the self-respect and self-image of children who are members of an oppressed group [19]. For example, research on *Sesame Street*, which has characters in it from various minority groups, showed that minority children who watched the program gained in cultural pride, self-confidence, and interpersonal cooperation. Another study along the same lines depicted successful black athletes and successful black entertainers. It was found that viewing this movie had a positive impact on the self-confidence of black children.

TV not only can have a positive impact on the self-image of minority members, members of oppressed groups, it may even also have a positive effect on how they are viewed by members of the oppressive majority. A study on the impact of *Sesame Street* showed that, after viewing it for two years, white children develop more positive views toward children of other races [23].

Thus, TV is a powerful tool for democratizing Americans' image of the different groups that make up our pluralistic society. We have the choice of using the medium in this way or using it to reinforce negative stereotypes, far too often the case in current programming.

Cognitive Development and the Acquisition of Social Knowledge from TV

Like cognitive content, social knowledge is also mediated by the relationship between cognitive development and the processing of formal features of TV. For example, it has been shown that younger children remember dialogue on TV much less well than they remember action [9]. This fact, in turn, appears related to what kinds of shows can impact on young children's views of different social groups. Programs where black or Chicano characters act in socially valued ways lead to a change in self-image on the part of the minority group members and changes in images of minority groups on the part of majority group members,

as we have seen. There is another program that one might expect to have a similar impact—*All in the Family*. However, young children (first through third grade) respond very little to the “views of life” espoused by the characters. My explanation is a cognitive-developmental one. In *All in the Family*, views of social groups are basically communicated through dialogue, through Archie Bunker’s and others’ comments on various people and groups. This feature contrasts with shows, like *Sesame Street* and *Electric Company*, where the viewer sees members of minority groups acting in socially valued ways. Young children process direct action better than descriptive dialogue; hence *Roots*, where black characters are observed in action, changed children’s racial attitudes more than *All in the Family* [19].

CONCLUSIONS

Cognitive research overwhelmingly supports the truism that TV is a mass medium. Nevertheless, it involves special decoding skills, just as our more old-fashioned medium of print does. The literacy skills of the mass media do, however, seem to be much more easily acquired than those of print literacy. TV, therefore, has tremendous potential for counteracting the elitist bias of our educational system; radio may have a potential, although more limited, role in this as well. The specific findings reviewed lead to the conclusion that TV should be more widely used in schools. Introduced into the schools, TV should be used under the guidance of an adult and in conjunction with other media such as print and radio. Each of these media has its profile of cognitive advantages and disadvantages, and each medium can be used to enhance the impact of the others. Up to now, educators (myself included) have been literary snobs, regretting the passing of an old order where people *really* knew how to read and write. This attitude prevents us from seeing the revolutionary possibilities of TV and the mass media: they give new cognitive possibilities to oppressed groups and have the potential to induce favorable views of the many diverse groups in our pluralistic society.

TV’s power to develop visual skills also can be exploited in a socially useful way. Ferguson, in a 1977 article in *Science*, points out that the language of technology is basically a nonverbal language, and that people involved in technology need to be able to think in terms of images [24]. He points to a current bias in engineering schools toward educating in terms of numerical systems analysis, that is, by means of arbitrary symbols as opposed to visual icons. This bias has produced a lack of people who have the nonverbal reasoning skills to deal with the complexities of real machines and materials. This bias toward the type of non-iconic symbol systems used in writing is not limited to engineering schools, but is rife in our whole educational system. For those of us who are psychologists and educators, the time has come to start assisting in developing new educational techniques that would reflect the message of those media with which children spend a large part of their lives.

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