

## **Prenatal University: Commitment to Fetal-Family Bonding and the Strengthening of the Family Unit as an Educational Institution**

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**Abstract:** None available.

**Full Text:** Headnote ABSTRACT: This paper reviews The Prenatal University stimulation program, which is designed: 1) to create an interactive relationship between parents-to-be and the developing fetus, and 2) to reinforce a "preconscious awareness of the environment" by the developing fetus. The prenatal stimulation program is designed with working parents in mind. Only two five-minute sessions are required per day for effective implementation. Both mother and father are involved; siblings and other relatives are also encouraged to join in the game-like sessions. Prenatal stimulation allows mother/infant and father/infant bonding, and strengthens familial bonding through interactive communication. Primary communication begins during the "kick game," in which either parent presses upon the stomach in the area of the fetus' foot and the fetus responds with a kick; the parents can then perceive their fetus as being human. Mother and father are equally involved in the stimulation process, setting up positive co-parenting patterns that usually continue after the birth. Siblings who are allowed to talk to the fetus and feel it through their mother's stomach can develop a positive relationship with the baby before it is brought home from the hospital. The program also emphasizes continued physical intimacy between father- and mother-to-be, as father is instructed to pat, rub, and place his lips on mother's abdomen to communicate with the fetus. Prenatal stimulation introduces an associative learning process that may impact fetal development through the fetus' auditory, tactile, and spatial senses. Stimulation of these senses begins at 20 weeks of gestation; more complex musical tones and verbal stimulation are introduced at 32 weeks. The program recommends stimulation during heightened fetal activity when the fetus is more alert. The stimulus-response interaction during the five-minute program reinforces development of the infant's attention span and, if consistently implemented, can condition the infant to a pattern of activity and sleep that continues well after birth. Follow-up interactions with parents and infants support the program's assertions and cite the long-lasting affects of prenatal stimulation upon subjects as they grow into childhood. ABOUT THIS PAPER: Although babies started kicking and mothers started talking to babies millions of years ago, inventive obstetrician Rene Van de Carr was struck by the way one of his pregnant mothers had begun a mutual touch-dialogue with her kicking prelate. The doctor began at once to create a whole series of experiences other parents might use to form early connections with their babies in the womb. Before he knew it, he had become the "grandfather" of a new movement of prenatal stimulation—an idea that spread rapidly, aided in part by the comic strip Cathy®, which suddenly had pregnant couples talking to babies in bedrooms across America. Headnote Joined by psychotherapist Kristin Van de Carr (his spouse) and Marc Lehrer, a developmental psychologist, the team did a series of experiments to see if prenatal stimulation made any difference to parents and babies. Their first scientific report comparing participants and non-participants in their program found significant differences. It was published in the first volume and first issue of this Journal (Van de Carr &Lehrer, 1986), followed by a study of 20 experimental and 20 control subjects drawn from the practice of five obstetricians in the same hospital (Van de Carr, Van de Carr &Lehrer, 1988). Again, significant differences were found. The paper which follows, a reprint of the Van de Carr and Lehrer 1988 paper, gives a splendid overview of their program and its value to participants. Their prenatal program is fully in explained in the book, While You Are Expecting: Your Own Prenatal Classroom (Van de Carr &Lehrer, 1997). INTRODUCTION In early 1970 during my obstetric practice I had begun to consider how mothers could make better contact with their babies before birth. My interest was prompted by birth experiences which alerted me to different levels of

consciousness in babies at birth. Many mothers at that time were receiving large amounts of anesthetics or medication as a matter of course. The relatively few mothers who used little or no anesthetics were therefore of interest to me. Their babies appeared to be more alert and more "person like," if I can use that word. You must remember, I am talking about the early 1970's, before the marked interest in prenatal awareness that was later to develop and in addition, I was Chief of Obstetrics at St. Rose Hospital and running a busy medical practice. Those of you who know how obstetrics was practiced at that time will no doubt recognize that there was often little time, and many of my colleagues at that time had little interest in making observations about the consciousness of the newborn beyond the physical status of the infant. I, however, had this interest and began speculating about the implications of that awareness. It seemed to me at that time that it must mean that the babies were far more aware than was usually considered, during, at least, the last trimester of the pregnancy. Extending my reasoning, I concluded at that time that sensory capabilities were present for extended times before birth, so because evolution and mother nature have good reasons for things, perhaps there was a reason for these sensory capabilities before birth as well. I was familiar with some of the research with the development of the visual systems using cats that had demonstrated critical periods in the learning of visual responses for horizontal and vertical lines in the short periods of time following birth. What I thought must be going on was some analogous process during the prenatal period. This would further imply that the baby was taking in stimuli and probably learning to use the stimuli to develop further the sensory systems before it was born. However, couldn't it also be possible that while at one level as sensory systems were being developed, there were other social and emotional consequences of the interaction of the developing sensory capabilities in connection with the mother's awareness of her child and the infant's developing preconscious awareness? Unfortunately, in all my attempts at that time to contact developmental psychologists asking for research and leads about the preconscious capabilities of the fetus, I met with at worst statements about the ridiculousness of infant capabilities before birth or at best, replies of: "I'm sorry we have no evidence to support fetal capabilities before birth." From 1979 on I started using instructional manuals and video instructional tapes to some extent to show parents how to do prenatal stimulation. I chose this route rather than one of discussion because I realized that if health care professionals such as physicians or midwives were going to support prenatal interventions the programs had to involve minimal extra time or the scheduling demands of a busy private practice would continually interfere with instruction time. I also learned from listening to the mothers and fathers that many were working, and they too didn't have that much extra time either. You must realize that I practice in Hayward, California, and that most of my patients are from lower- and middle-class working and light industrial backgrounds. However, in 1979, I made a decision that the prenatal method I would advocate would have to be explainable with the use of a brief manual or with some video examples that could be seen at the office or at home. I also decided that the methods couldn't be too time-consuming for the parents or they wouldn't be able to be used by working mothers. To date, my personal experience with over 1,000 patients using the programs and the thousands of letters and responses from persons throughout the world have supported these decisions. No one complains that the program is too difficult; few find that they have no time for it. Those parents who have more time have the choice of adding additional levels of complexity and repetition to the exercises. The research Dr. Lehrer and I have reported during the last few years supports the effectiveness of only two five-minute sessions per day when using the Prenatal University program. Every few years, because I was doing this alone, I updated what I had learned and added a few pages of instruction and prenatal exercises. When Dr. Lehrer joined me in 1983, we set about to create more comprehensive versions of the program to include many other connections between prenatal stimulation and postnatal exercises with the baby. Toward this end we have sent out thousands of manuals of instruction that parents have used at home during their pregnancy. We have helped popularize the idea of communicating with, singing to and loving the baby before it is born. About 2 1/2 years ago a writer for a major cartoon strip interviewed me about our program. A short time later a series of cartoons appeared in "Cathy®" (Guisewite, 1986) that were a direct takeoff of our program. These cartoons

were seen by millions of people and by thousands upon thousands of families with a pregnancy, by single parents to be, and by people thinking about having a baby. It is a very interesting commentary upon our society that all of the attempts Dr. Lehrer and I made at publicizing The Prenatal University program up to that time in scientific publications, professional conferences, and in conferences directed to obstetricians throughout the United States resulted generally in skepticism from my obstetric colleagues and interest from parents to be. After this series of cartoons started appearing, patient after patient who came into my practice responded when I told them about the prenatal stimulation program, "Oh yes, I'm talking to my baby." They then proceeded to read the manuals and do the program with little other explanation. I then started receiving reports from all over the country during the many talk show interviews that I've had, that pregnant women were no longer being told by their obstetricians that the idea of communicating with their baby before birth was just a bunch of California nonsense. Rather than conclude that obstetricians believe what they read in cartoons more than in professional publications, I would instead offer the idea that obstetric care in the United States and in some areas throughout the world is being fundamentally altered in the direction of respecting the health-enhancing potentials of mother and father acceptance of the fetus as a family member before birth. I maintain that this process has a tremendous potential for reducing complications during pregnancy, for reducing stresses upon the family system during and after pregnancy, and for having a number of additional beneficial consequences to fetal development, in terms of the health, and emotional and intellectual potential of the child who has received this acceptance before birth. In addition, as we reported last year at the conference in Austria, our data suggest that positive acceptance of the fetus as a family member before birth has the potential to reduce abusive behaviors to the young infant and to establish a positive set of behaviors toward the baby before birth. We believe that in populations who have been identified as high risk for child abuse that it is easier to create positive role behaviors toward a new baby before it is born than after the baby has arrived and is making demands for attention. Toward this end the Department for the Development of Human Intelligence in Venezuela has begun using our program in rural and economically stressed areas in the hope of strengthening family bonding patterns, reducing child abuse and improving intellectual capabilities. There are five major areas related to prenatal stimulation and to the Prenatal University program. From our experience, if you want to do effective prenatal stimulation you have to take all of these areas into account. They are: a developmental basis, a scientific basis, a practical basis, an interpersonal basis and an emotional basis. Developmental Basis By a developmental basis we mean anything that has to do with the normal development of the fetus. In considering the developmental aspects of the Prenatal University Program, we have engineered the program to capitalize on certain critical windows of capability that the growing and developing fetus presents at various stages of the pregnancy. We know that the capability of reactive movement on the part of the fetus is present and can be measured clinically as early as 12 weeks. However, from the practical standpoint we have waited until we feel that the auditory capability of the baby will be developing, and we have at the fifth month, or approximately 20 weeks, begun combining a stimulus of both auditory and tactile associated mechanisms. In this way as the auditory capability of the fetus is developing, it will be exposed to the concomitant tactile signal and auditory signal that will allow the associated learning process in relationship to the onset of the auditory capability. This also is useful in terms of focusing the baby's awareness in the auditory area. Visual, olfactory, gustatory areas will similarly be developing at their appropriate plateaux in the pregnancy, but the most easily accessible are the tactile and auditory and, to a more limited extent, visual capabilities. We have worked with this interactive model from 20 weeks of pregnancy to approximately 28 weeks, at which time we believe that the fetus is capable of responding to more complexity than was initially present during the kick game or attention-getting phase of the pregnancy. Thus at 28 weeks, we begin to vary the tactile and auditory signals the baby receives in a consistent and repetitive fashion. Continuing onward at 32 weeks, the complexity of the combined auditory and tactile signal is increased, and we begin in our program producing combined auditory signals, such as with musical tone and a verbal stimulation consistently associated, continuing until approximately 36 weeks. In the last lunar

month of pregnancy song singing and story telling, using previously presented words are continued till term as we believe the baby's capability and interest in assimilating more complex stimuli seem to be moving along. Complex word and music association such as Bible reading, opera, and symphony have been used by some parents during this time. We suggest to the mother that the communicative and stimulating processes be timed to moments when the baby will tend to be in the responsive alert state. Much of baby's time in utero is spent in the stage 3 or 4 sleep state, especially when the fetal and the maternal blood sugar is low. However, approximately an hour and a half to two hours after eating, when the mother's blood sugar is elevated, the fetus usually assumes a higher activity level with spontaneous and repetitive kicking and motion. We have suggested that the most effective time for the communicative process is when the fetus has been signaling that it is in an awake and active state by producing its self-evoked kick or prod, or when the baby seems to be responsive to an external poke or prod from the parent. If the baby returns the stimulus by kicking, it is suggested that the fetus is now in a reactive mode and that the communicative effort will be most effective. Another aspect of our program is the repetition of a series of simple monosyllabic sounds. The mother or father sings these words during the last few months of pregnancy to a given tune. We call these words "Infant Speak." Infant Speak, from a developmental basis, tunes into the infant's capability and tendency in early speech to use repetitive similar syllables in its first attempts to utilize speech. Babies universally will tend to use simple monosyllabic words for needs or body functions. Mothers on a worldwide basis also tend to select these particular words or similar ones for these functions. It is apparently easy for the baby to say the same word twice, easier than it is to say two different words as one would say a sentence. Infant Speak programs the baby to be familiar with the particular repetitive monosyllabic words that are used in that particular culture into which he or she is being born so that the words will be similar to what the mother would use for food, bowel movement, urination, and words of greeting. These repetitive monosyllabic words are repeatedly given to the baby so there is an inherent familiarity, and we believe that these word tools will then allow babies to seek effective speech earlier than they would without this verbal familiarity provided by Infant Speak. I first became aware of these repetitive monosyllabic patterns of infant speech through looking at many children (I also have seven of my own) who were attempting to express a need for something and seeing what kind of words they were trying to utilize. I postulated that if babies had already gotten messages and had a rudimentary understanding of primary infant action concepts, then they would communicate and repeat their communications. Therefore any repeated sounds might be important. When I made these observations over a period of time, I noticed that the repeated primary infant action patterns were associated with utterances and babbling that were frequently monosyllabic. Over time I identified a number of repeated monosyllabic patterns which formed the basis of a primary infant action vocabulary. I named the most frequently used patterns "Infant Speak." I also believe that rhythmical expression of these patterns is a natural part of the process. For that reason, in the Prenatal Program we introduce the use of Infant Speak in connection with a well-known melody, that of "Ring around the Rosy." It may be that this melody and the repetitive monosyllabic expressions are genetically encoded in a similar way to that of songs for birds. Whatever the reason, we have had an unusual number of reports from parents of being able to identify and use Infant Speak with their very young infants. For whatever reason, parents using Infant Speak feel that they and their babies communicate better. Scientific Basis One of the most exciting areas of the last five years for me has been the verification of the many aspects of fetal sensory capabilities. I would like to summarize briefly the current findings on when different sensory capabilities develop and how these are linked to the prenatal enhancement exercises that we use in the program. There are also several general principles of learning that we have found to be important in our prenatal stimulation exercises. Central to our understanding of the use of prenatal stimulation are: 1. How the exercises work in terms of reinforcing the fetus. First-conditioned learning. For example: when a mother pairs the word "pat" with the action of patting her abdomen. Examples of primary word list and specific actions. 2. How the exercise shapes the mother's or father's or other participant's behaviors toward the fetus and toward other family members. We feel that this second element is

just as important as any potential enhancement of fetal capabilities resulting from prenatal stimulation. For instance, when the father is consistently speaking to his unborn baby by placing his lips on his wife's pregnant abdomen, benefits of secondary learning are being reinforced. First he is keeping a physical intimacy with his wife that all too often is de-emphasized during pregnancy. Frequently the father-to-be is emotionally isolated from sharing the awareness of the growing life in his wife's body. In contrast, the mother discusses her pregnancy with women friends, with her mother or with her doctor. We feel that the use of exercises that give a clearly defined and important role to the father during pregnancy function to include the father in a closer emotional bonding process with both his wife and child. Furthermore, some of the exercises we have developed specifically help parents keep a consistent intimacy throughout the pregnancy with the goal of promoting a natural reestablishment of physical and sexual relationships following the birth of the child.

### 3. Contingency reinforced learning.

First, we ask mothers to learn to recognize those times when their babies are more active than other times. Instructions are given about observing times of increased activity, following a meal, for instance. The general principle is that when the mother or parents have the opportunity to structure their five-minute stimulation sessions in connection with heightened fetal activity, they are helping to use reinforcement at times when the baby is most likely to be attentive and not asleep; to reinforce the development of the baby's attention span; and in addition, to teach the parents indirectly to relate to active times with their young infant. I cannot overemphasize the importance of producing positive patterns of relating to the infant through teaching parents good relating habits during the pregnancy. These principles of learning apply to fetal learning as well. It is our concept that prenatal stimulation when used in a consistent way can introduce a preconscious awareness of the environment in the developing fetus. This is especially relevant from the fifth month of pregnancy onward; however, earlier conditioning and reinforcements are already a reality and play a significant role in development (see Logan, 1988). We have also introduced heartbeats and drum rhythms early in our program (Van de Carr & Lehrer, 1997, pp. 52-58).

### Preconscious Awareness and Number and Spatial Sense

I'd like to give you some examples drawn from what parents have told me about using various aspects of the Prenatal University Program. Concerning the "kick game", one of the exercises initially begun at about 5 months of pregnancy we've had four reports I've documented of people claiming that the number of kicks could be determined by the number of presses that the parents made. Therefore, if the father presses twice, the 7 month old fetus would kick back twice, for instance. Once this pattern is established, the parents could and did vary the number of presses and were able to experience the comparable number of kicks in return. I observed this activity in at least eight instances. As you can imagine, this is a quite convincing demonstration to the parents that their baby is responding to them and is already a little human being. There's also been a much larger number of reports of the fetal foot, or small part, tending to follow the parental stimulus area, so that if the parent moved the hand on the abdomen, the baby's foot or small part tended to follow the area and would move with it. This would seem to indicate that the baby was trying to touch the inside of the womb in the same area that the parent was poking or prodding, suggesting that the baby had the ability to have spatial awareness within the uterus and apparently had sufficient memory to retain a rudimentary concept of numbers.

### Patterning for Regular Sleep Cycles During Infancy

In addition, throughout the years, a number of parents have said that if their communicative session occurred at a particular time of night, that following birth the baby would become playful and awake at the same time of night, suggesting that there is some sort of circadian wakefulness established *in utero* and presented *post partum*. Many of our parents find that if a particular song or piece of music is used at the finish of the communicative session during the prenatal period, that that same piece will be useful in helping the baby go to sleep and decrease its activity level if it is played *post partum*. Those parents who have reported this have also expressed a great sense of relief about the regularity of their baby's sleep and rest patterns. They are particularly aware of the contrast between their baby and the babies of friends who did not use this method of reinforcement during the pregnancy.

### POSSIBLE PRENATAL MEMORIES

A number of investigations, many of which have been reported at these conferences, such as by Dr. Chamberlain (1994), suggest that hypnosis can

elicit birth and prebirth memories of quite specific nature and content. I would maintain that if such higher-level awareness is possible, it is more likely to be recalled if the stimuli are repetitive. In most of the research reported to date, the memories are mainly of singular events and are indicative of traumatic occurrences uncovered during therapeutic sessions to relieve symptomatology. Because of this, there are a number of methodological difficulties that arise in investigating the phenomenon. I am therefore more convinced that if we are to investigate prenatal memories, repetitive stimuli derived during pregnancy of a non-traumatic experiential nature can provide a methodological framework better able to demonstrate the phenomenon to the degree that it exists rather than having to depend upon adult patients or children who are being seen therapeutically. The type of exercises done in our program and the fact that they are repeated over time are therefore particularly well suited for helping to provide a data base for investigation of prenatal memories in populations with no particular psychopathology. I will illustrate using an unusual example of intrauterine learning reported by one of my patients. In this instance, the fetus was stimulated by the mother with two sessions a day through the fifth month onward. The mother also played a tape of the 10 words of Infant Speak under our direction. At birth this baby reacted and responded to the words heard on the tape. The mother reported that if a grandparent attempted to repeat these words with an accent so that they were mispronounced, the baby would cry. Later on when this child was about 16 months old, the mother had become approximately 5 months pregnant. According to her, the mother had not discussed the prenatal process after the child was born. Imagine her surprise when the following occurred: she showed her pregnant abdomen to the 16 month old child who was sitting on the floor and said, "Look at mom's big tummy, mommy has a baby in there." The child got up from the floor, walked to her mother's abdomen and repeated the process that she had been exposed to in utero by saying, "Pat, rub," and patted and rubbed the mother's abdomen. This was observed by several relatives. The child had no apparent ability to have learned this, had no exposure that we know of. While this example and others like it do not prove the existence of well defined prenatal memories carried along after birth, it does suggest that it might be possible to test prenatal memory as an ability to remember specific procedures learned in the prenatal period and performed later in infancy.

**DIET AND CARE** We use the following nutritional guidelines in our program and have some recommended diets and inexpensive and easy-to-make recipes. We advise that mothers ideally in the one to two months prior to pregnancy, if possible, increase their protein intake to between 80-100 mg. per day, and we suggest that they be on a vitamin and mineral supplement prior to pregnancy. This process, we feel, is effective until about the fifth month of pregnancy when protein requirements are diminishing such that the significance of high protein intake seem to be less. At the fifth month we suggest that a diet higher in choline as well as the mineral and vitamin supplements may be beneficial in the establishment in the intersynaptic processes that will be continuing after the original termination of the growth of the neuro-cellular component occurring at 19-20 weeks. On an environmental basis, we suggest that the mother should diminish the exposure to allergens and the possibility to infections, keeping in mind that resistance to colds and viral infections seems to diminish in the afternoons from 1:00-5:00 and that the strongest times of resistance are prior to 1:00, suggesting that contact with large groups of people should ideally be timed to the morning hours. Allergens should be removed especially from the area of the bedroom where possible, using dust filters and/or negative ion generators to remove as many allergenic particles from the breathing area as practical. Avoidance of toxins is obvious (such as alcohol, caffeine, paint fumes, hair sprays, finger nail polish), certainly the avoidance of any drugs that are not absolutely mandatory for maternal or fetal health.

**PRACTICAL GUIDELINES** There are in reality so many different exercises that parents could do during a pregnancy. In fact, they could be spending 24 hours a day relating to their unborn child. I believe this would be a terrible mistake. One of the worst aspects of infant stimulation as it has been presented to the public by some programs is that parents too often get the message that if 30 minutes of stimulation is good, then two hours must be so much the better. I have heard of parents who spend too much time taking their infants from one baby exercise program to the next, or race between flash card reading marathons and infant massage sessions that may leave mom too exhausted at

night to play with the baby. As a practical principle of prenatal and early infant stimulation I have found that for the general population—and I am not talking about populations of university educated parents, but of all parents—about 5 to 10 minutes per day, twice per day is all that parents are really willing to do on top of all of the other things that they have to take care of in their lives. I am, in fact, generally unwilling to recommend any more than this brief amount of time per day for such exercises. The philosophy behind Prenatal University is to teach parents to incorporate naturally principles of positive reinforcement and emotional bonding in the family, and to extend what they practice during the prenatal period after the baby is born. The easiest way to insure that the parent will not follow through with these programs is to make what they do into yet another daily chore on the way to having a baby. The best way we have found to enhance the parent's continuation of positive patterns of relating to their baby is to make the recommended exercises easy to do, to take brief periods of time, and above all, to be fun for the parents. Our manuals are constructed with these points in mind, and we have found this to be very helpful over time in working with many parents. I am not saying it is wrong to do more. I also know a number of highly motivated parents who are intrigued and interested in doing even more during the prenatal periods. We include advanced exercises for them in our materials. However, I also believe that for every parent who is successful in being able to allocate a large percentage of time to additional prenatal reinforcement, there are a great many more parents-to-be who suffer in thinking that they should be doing more, or who resent doing as much as they think they should be doing. In our program since we are attempting to reach as many parents as possible, we take the position of doing the minimal amount of prenatal stimulation that gets the job done unless the parent really enjoys doing more. Another practical issue we have found to be of great importance, is that the mother is more malleable and more accepting of suggestions prior to the infant's birth. Even if the mother has had other children prior to this pregnancy, I think that there is a biologic birth-activated mechanism of maternal advocacy that occurs in the one to two days after birth. I refer to that time several hours to several days afterbirth when the mother seems to affirm her confidence level and bonding process by asserting her ability to care for her infant. We call this period the Maternal Advocacy Period. At that point mothers seem to become more resistant and less accepting of suggestions from others about how to care for their baby. This observation is made time and time again. I believe this is a universal phenomenon related to bonding issues. From a practical sense then, the mother can be more easily reached with suggestions about how to care for her baby and how to develop a beneficial interactive relationship prior to birth. Thus if positive relating patterns can be developed prior to birth, they will likely be continued after birth.

#### PERSONAL EMOTIONAL RESPONSE TO FETUS

The Prenatal University Program presents an approach in which the mother, father and other children begin to identify the fetus as an individual and relate to that individual before birth. Also of importance, the fetus in this relationship is considered an understanding and responsive being. We think that this forms the basis of developing a sense of familial respect and caring extending far beyond the initial times of infancy. Our follow-ups with children who have been in our program, some of whom are as old as 7 years, show the development of very good interpersonal skills compared to siblings and peers who have not been in the program. In addition, when family members are making contact and learning to relate with the fetus before birth, this interrelationship is in most cases (when amniocentesis is not used) occurring without regard to gender. That is, in the usual case no one knows if the baby will be a girl or a boy. It allows the relationship to grow, mature, and the bonding process to effect itself, without the cultural overlays and stereotypes which normally occur after the baby has been assigned to a particular sexual category. Therefore the use of the Prenatal University Program significantly alters, and in our opinion, shields the baby from some of the potentially negative influences of gender stereotyping. The parents have already developed a relationship; they cannot discount the wrong sex baby as less an individual of importance, as is often done when birth is perceived as the beginning of the relationship. A second factor of importance related to emotion when using this program is that it allows the parent a stress-free, frustration-free time to practice getting to know the baby as an individual before birth and to practice relating to each other about child care issues. After birth, the incessant demands, fatigue, and other

complexities that can arise when dealing with one or more children and possibly working at the same time, can reinforce feeling of inadequacy in parents, especially single parents. To the degree that the parent is stressed, it will severely hamper his or her ability to perceive the baby as an individual who is intelligent, interactive, and responsive. Mothers and fathers who have been through our program are more likely to consider that any action of their baby is a potential communication, rather than thinking that crying, wanting to be fed, or have diapers changed is yet another burdensome aspects of infant care. We feel that the best chance of developing positive habits of relating to the infant is during the prenatal period. The relationships between other family members, and perhaps between parents of the fetus, are also certainly affected by the bonding process that occurs in the prenatal period. Uncles, aunts, brothers and sisters, if they have been communicating with the baby, tend to have the expectation that the baby will continue to communicate with them post birth. Since our studies have largely supported that prenatally stimulated babies smile earlier and are judged as relating to other family members better than babies that have not been exposed to this stimulation, it appears that an ongoing, positive, self-perpetuating process is initiated. Simply put, the development of positive expectancies from prenatal stimulation exercises results in a carry-over to communication with the infant and then throughout childhood as well. We feel that this process occurs and complements any developmental enhancement in our prenatally stimulated youngsters. I might call your attention to research in elementary schools showing that if teachers are told that certain youngsters are high achievers, then these youngsters obtain higher grades and accomplish more. More importantly, the research has demonstrated that this phenomenon also occurs when the designated high achievers are randomly selected. Therefore, when parents use the Prenatal University Program they are both building a positive expectancy for their relating with their child and may also be stimulating greater abilities from the exercises themselves. Another aspect of our program concerns the role of the father during pregnancy. The father plays a useful and significant role in our program. Clearly this involvement during the pregnancy has beneficial effects not only for the father, but most mothers will respond very positively to this involvement. Their affection for the mate tends to become increased because of this sharing and the perceived co-commitment to the infant's development. Prenatal University's Future Goals It is our goal to get the Prenatal University materials in the hands of as many parents as possible. As we reported at the last conference in Austria, some of our results show better evaluations of the baby by the mother on standardized measures such as the Neonatal Perception Inventory. This is an important and desirable outcome especially in economically disadvantaged families. A number of investigators have demonstrated that child abuse is relatable to extra-familial stress levels and to lack of positive bonding experiences in pregnancy and during early infancy. For want of a better concept, "another mouth to feed" competes with and can override potential positive maternal and paternal bonding. Our program helps create better bonding patterns and is, therefore, especially useful in economically deprived populations. The manuals in use up through 1986 were translated into Spanish, Italian, German, and a number of other languages. The newest versions from this year are in the process of being translated. Of interest here, the government of Venezuela has adopted and adapted the program for use in an effort to help improve infant care and prevent child abuse. We would like to expand our efforts in these areas in the future.

**SUMMARY** This paper presents the major theories of parental-fetal interaction that have been successfully implemented during pregnancies since 1979. The program is designed for the working parent using ordinary objects in simple and fun activities that can be scheduled for any time of day. The program allows for the meaningful involvement of all family members. The development of the program was a balance between what would be effective for fetal development but compatible with parental motivation. Activities chosen were those that parents could and would initiate on a consistent, repetitive basis. Part of the popularity of the prenatal stimulation process with thousands of parents is the ease with which it can be learned and implemented. Though cultural and socio-economic factors of the parents' background may alter some of the procedures, the level of program effectiveness tends to remain constant. Over seven years of practical experience and follow-up with parents and children who have received prenatal stimulation show a combination of: 1) significant improvement in the infant's performance; 2)



consistent reports of positive bonding between parents and child; and 3) an overall development of positive patterns in parent-child and parent-parent interactions as a result of participation in our program. References  
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