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|  | Introduction  The question of "What is menstrual synchrony?" is an unclear one. But still the question of "Who does menstrual synchrony effect?" is even more indeterminate. Many scientists including Martha McClintock and Richard Brown have done past research on the topic of menstrual synchrony. But, in order to fully understand menstrual synchrony it is important to understand the human female menstrual cycle.  Menstruation is the first full day of menstrual bleeding. The uterine lining built up in the previous cycle is cleared away, and the hormone levels from the previous cycle take a sharp decline. During pre-ovulation the pituitary gland releases a hormone called FSH (Follicle Stimulating Hormone), which stimulates an ovarian follicle to grow and an egg to mature. The pituitary gland also releases LH (Luteinizing Hormone) which stimulates the follicle to manufacture and secrete estrogen. Estrogen causes the uterine lining to grow. During ovulation the pituitary gland releases a surge of LH. Then the follicle will rupture, releasing the matured egg into the fallopian tube. The remainder of the ruptured follicle (called the corpus lutetium) recedes back to the ovary and begins to secrete progesterone. Progesterone causes an increase in blood vessels to the uterine lining and inhibits other eggs from developing. Finally, the luteal phase is the period of time (usually 11-14 days) following ovulation. If the egg has not been released within 24 hours, the corpus lutetium regresses and slows its progesterone production. After around 11-14 days, there is no longer enough progesterone to supply the uterine lining with blood, and so a new menstruation begins. When women experience menstrual synchrony their menstrual cycles converge and the women undergo pre-ovulation, ovulation, the luteal phase and menstruation at the same period of time.  Martha McClintock did a study in 1971 that showed menstrual synchrony was possible. Martha McClintock believed menstrual synchrony was related to pheromones, which are odorless chemical signals given off by women that can change other women's menstrual cycles. But, McClintock was unable to pin down how this synchrony came about. As a result, she conducted an experiment and had nine women wear pads under their armpits for eight-hour intervals during different phases of their menstrual cycles. The researchers then disinfected the pads with alcohol and froze them, at the same time hoping to keep the pheromones intact. Each day, the researchers rubbed the odorless pads above the upper lip of 20 women with regular menstrual periods. For two months, ten women sniffed residue from the pads collected earlier in the cycle (before ovulation) while the other ten women were exposed to secretions collected after ovulation. Then the protocol was reversed and the women sniffed the opposite pads from the other menstrual cycle. Most importantly, the subjects did not know the origin of the pads. McClintock found that the odorless compounds from the armpits of women in the late ovulatory stage in their menstrual cycles accelerated the pre-ovulatory surge of the luteinizing hormone of the recipient women and shortened their menstrual cycles. The opposite effect occurred when the underarm compounds of the same donors were collected later in the menstrual cycle. They delayed the luteinizing hormone surge of the recipients and lengthened their menstrual cycles. It is evident that through a controlled experiment the timing of ovulation can be manipulated due to human pheromones. The work "shows for the first time that people can communicate with pheromones," commented Aron Weller, a psychobiologist at Bar-Illan University in Ramat Gan, Israel.  Other scientists have also suspected that animals give off pheromones, which convey messages to others of their species. Pheromones in a rat's life are also prominent. McClintock did a study in 1978 that showed that olfactory stimuli, which are related to the senses, from grouped female rats, would induce oestrus synchrony. For his experiment McClintock housed rats in groups of six. One group had light induced constant oestrus females and the other group showed induced oestrus. "Theses females were in oestrus 56% of the test days, as opposed to the 25% for controls which lived up wind of the oestrus females."3 The pheromones of the rats from one cage were passed to the other group of rats in the other cage via wind. The 56% of the rats were experiencing oestrus synchrony because their cycles were being effected by the same pheromones of the rats that lived in the cages upwind from them. McClintock was once again correct; the rats showed oestrus synchrony due to pheromones.  Richard Brown did another study on rats concerning oestrus synchrony. He housed rats in groups ranging from three to four all the way to forty or fifty. He found that the rats tended to reduce their oestrus cycle from the normal five to four days. Not only did Brown find that the rats had a shorter cycle he also noted that the grouped rats tended to show oestrus synchrony. This oestrus synchrony occurred in female rats, which were in contact with other rats through cages connected with plastic tubing. It normally took about three to four cycles (12 to 16 days in rats) for the synchrony to occur. Ironically, Brown realized that this was precisely how long it took for roommates and close friends to synchronize based on a previous study done by McClintock. He hypothesized that the timing of ovulation, and also the change in the menstrual cycle of women is directly related to the contact they share with each other. In other words, the closer associated females are with each other the more their menstrual cycles converge. But, it wasn't until Martha McClintock's study on roommates and close friends that proved that women who live in the same environment or are in direct contact with each other have converging menstrual cycles.  Martha McClintock was able to conduct an experiment that suggested synchrony was prevalent among a group of women living together in a college dormitory. She believed that their social interaction could have a strong effect on the menstrual cycle. The fact that women who live in a college dormitory generally eat in a common dining room, have a similar life pattern, and repeated stress periods might also effect synchrony. Three times during the academic year each subject was asked when her second and last menstrual periods had begun. The date for all cycles was between late September and early April. McClintock also compared the menstrual cycles of women who were qualified as "close friends." The women were considered close friends if both of them saw each other often and did not live together. Women who were taking oral contraceptives at this time were considered individually invariant because their menstrual cycle is regulated due to the contraceptive and cannot be altered. These women who were taking oral contraceptives were still included in the analysis because their influence on the menstrual cycles of the others was unknown. McClintock was able to establish that synchronization occurred between close friends and roommates. 4  While McClintock was conducting her experiment among roommates and close friends she suspected that men could play an important role in controlling the menstrual cycles of females. McClintock asked each of her subjects how many times a week they were in the company of males. The women were then separated into two groups, one than was in the company of a male once or twice a week and the second group was of women who three or more times a week with a male. Those who estimated seeing males less that three times per week experienced longer cycles than the other group whose cycle corresponded with the national norm of 28 days. The duration of the menstruation was the same only the length of the cycle was altered. Many of the subjects stated that they became more regular and had shorter cycles when they dated more often. For example, one subject reported that she had a cycle length of six months until she started to see males more frequently. Her cycle length then shortened to 4.5 weeks. Then, when she stopped seeing males as often, her cycle lengthened again. This could be related to a pheromone mechanism that males release which alters the menstrual cycle of women. Dr. Alex Comfort also supported this idea. Comfort believed that menstruation for girls has a direct correlation with the odors that they are exposed to from the opposite sex. Once again pheromones have a direct effect on menstrual synchrony among women.  This phenomenon had been documented in mice and is called the Lee-Boot effect. The Lee-Boot effect states that mice who are raised alone in sterile cages have a much higher age of maturation than that of female mice raised alone in cages filled with male mouse's bedding material. These females also experience synchrony in their oestrus cycles.  Menstrual synchrony has been typically studied among women who live together but a current study conducted by L.Weller examined menstrual synchrony in 51 pairs of women working together under conditions optimally conductive to synchrony. The conditions that were conductive to menstrual synchrony were that the women had been working together for at least one year, shared a relatively small office and worked there all day full time. The records of three menstrual dates showed a significant degree of synchrony for each of the three months. Menstrual onsets of close friends tended to occur on the average within 3.5-4.3 days of each other while onsets of coworkers who were not close friends were significantly more broadly ranged (7.7-9 days of each other).5 This shows that menstrual synchrony exists among co-workers but the range of synchrony is much farther apart.  Menstrual synchrony has also been supported through the data collected by Bedouin nuclear families. For example, menstrual data was collected for three months from 27 Bedouin nuclear families living under conditions optimally conductive for synchrony. These conditions included women who live together for many years, a highly sexually segregated society, standard living conditions, and minimal use of oral contraceptives. The results showed that without a doubt menstrual synchrony existed. There was a 20%-25% shift toward synchrony found among sisters who were roommates.  Another study was done among friends who did not live together and among sisters who did and did and did not share a bedroom together. A very high degree of synchrony was found among families (51%) and among sisters (51%), and a relatively high degree of synchrony was found among close friends (30%).6 The results showed that synchrony can be attained without sleeping in the same bedroom or even in the same house. The findings also suggest that an effective range of mutual exposure is an attribute of human menstrual synchrony.  After researching menstrual synchrony and finding evidence that menstrual synchrony existed among close friends, roommates, and co-workers, we wanted to conduct a survey to show which group of women showed the most menstrual synchrony. We have heard many women who experience converging menstrual cycles with their roommates, close friends or co-workers. For example, one woman had emailed a scientist and she was writing about her personal experience with menstrual synchrony.  "I work in a lab that is mostly women and, for one year, we conducted our own unofficial "menstrual synchrony study" just because we were all talking about cramps one day and one thing led to another and we started to realize that we were converging. There were basically 5 of us who kept records, and in general, we all fell within a week of each other- all centered around the one woman on the pill. The most outlying individuals were this MD who wasn't in the lab as much and had more sporadic time and this woman who has always been woefully underweight and may have eating disorders. We did have a few women come into the lab and participate for a short while and they seemed to converge as wellÖ."  "ÖIt was unfortunate that we don't have the study going on anymore because one of the women have recently become pregnant (she sits and works right next to me). I was laughing with her the other day because I swear I haven't had menstrual cramps since she got pregnant. I told her that she must be sweating hormones and fooling my systemÖ"7  There was also another article that I read from was woman who also experienced menstrual synchrony. She wrote:  " I live in a suite with 3 of my frosh and about three months into the school year they had all begun to converge to the same menstrual cycle."8  These letters, which were published on the Internet, caught our attention and we wanted to do more research on the topic. Most importantly we wanted to see which group of women (roommates, close friends, and co-workers) exhibited the most menstrual synchrony.  Excerpt from the SCiENCE newsroom posted Mar.11, 1998  http://www.apnet.com/inscight/03111998/graphb.htm  3 http://www.students.haverford.edu/wmbweb/writings/joconverge.html  4 Excerpt from Nature(vol.229, pp.224-225, 22 Jan.1971)  5 Psychoneuroendocrinology 1999 May; 24(4): 449-59  6 Excerpt from J Comp Psychol 1999 Sept; 113 (3): 261-8  7 http://www.students.haverford.edu/wmbweb/writings/joconverge.html  8 http://www.students.haverford.edu/wmbweb/writings/joconverge.html  [next](http://docs.google.com/hypo.html) | |
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