

Cross-Cultural Consistencies in Prenatal Perceptual Patterns and Perinatal Practices

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Abstract

Cross-cultural consistencies over two decades are seen in patterns of perceptual functioning and reproductive behaviours in diverse samples in the United States, Israel, Switzerland, and Antigua, West Indies. Relative independence from background pressure in neutral perception tasks predicts adaptive freedom from cultural pressures influencing prenatal sexual and contraceptive behaviours, options used for achieving and monitoring pregnancies, and perinatal infant care behaviours. The apparent paradox of increased individual differentiation and independent activity in parents prenatally who show more active attachment interactions with their infants after birth is explained. The relevance of cultural freedom or constriction to individual autonomy and flexibility in perceptual information processing and prenatal patterns which predict the course of labour and delivery as well as perinatal parent-infant interaction is explained. The implications of these cross-cultural patterns of individual psychological differentiation, sexuality, reproduction, prenatal and perinatal family interactions in society are discussed.

Zusammenfassung

Es wurde eine Beständigkeit in den Mustern der Wahrnehmung und des Reproduktionsverhaltens in verschiedenen Untersuchungsgruppen in den Vereinigten Staaten, Israel, der Schweiz und Antigua in Westindien beobachtet. Wenn jemand Figuren unabhängig vom

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Hintergrund wahrnehmen kann, dann kann man vorhersagen, daß er sich relativ unabhängig von seinen kulturellen Normen verhalten kann, die das sexuelle Verhalten vor der Geburt und die Kontrazeption beeinflussen, wie ebenso den Umgang und die Gestaltung der Schwangerschaft, wie den Umgang den Umgang mit dem Kind nach der Geburt. Das scheinbare Paradox einer größeren individuellen Differenziertheit und unabhängigen Aktivität bei Eltern vor der Geburt, die nach der Geburt eine lebendigere Beziehung und Bindung mit ihren Kindern haben, wird erklärt. Die Bedeutung von kultureller Freiheit oder Einengung der individuellen Autonomie und Flexibilität führt die Informationsverarbeitung der Wahrnehmung wird erklärt, wie ebenso die pränatalen Verhaltensmuster, aus denen sich der Verlauf der Wehen und der Geburt ebenso wie die Eigenart der frühen Mutter-Kind-Interaktionen voraussagen läßt. Die Implikationen dieser kulturübergreifenden Muster individueller psychologischer Differenzierung, sexuellen Verhaltens, reproduktiven Verhaltens, pränataler und perinataler Familienbeziehungen in der Gesellschaft werden diskutiert.

Purpose

The purpose of this paper is to provide empirical data and discussion of cross-cultural relations between prenatal patterns and of perceptual functioning and coping style, and perinatal practices of parent-infant interaction. The prenatal patterns are objectively defined and measured behaviours in coping with sexuality and reproduction, mastery of stress, perceptual tasks, and subjective experience as scaled and given in interviews with the adults or parents to be.

Background

Perceptual research in the 1950s indicated that patterns of processing information and coping with neutral tasks of focussing attention and ruling out background distractions were relatively stable personality characteristics predictive of consistent patterns of 'psychological differentiation'¹. More differentiation was found in self reliant 'inner direct'² persons in contrast with more global perceptual patterns of field dependence in more anxious, 'other directed'³. Psychological defenses in relatively undifferentiated people were less developed denial, repression, undercontrolled chaotic activity, and dependency, found by Lapidus⁴ to be consistent with ego passivity⁵. Childbirth preparation classes of training for focussed muscular and respiratory control of physiological childbirth stimuli, along with reduction of pain and fear-dominated responses in drugged, unprepared parturients⁶, were predicted and found by Lapidus⁴ to be chosen by high differentiation subjects.

Methods

The basic, neutral, content-free measures of level of psychological differentiation are provided by perceptual tasks of field-independence in which the subject must locate simple geometric shapes obscured by distracting background lines and complex designs. The task was presented individually in a series of design cards in the 1960s in the US and in Switzerland. More field-independence included in patterns of high differentiation, is defined by more rapid solution time to correctly outline the simple figure embedded in the complex design. In the 1980s, the Group Embedded Figures Test⁷ was used. In the group test, the subjects are instructed to draw the outline of the simple figure shown on the back of a test booklet, on the inner pages of the booklet of complex figures. Israelis samples were tested with the Lapidus⁸ (1987b), Hebrew Form of the Group Embedded Figures Test. An experimental standardized Offer of Choice of Preparation for childbirth classes was read to US subjects in the 1960s and the major dependent variable was the behavioural criterion of actually attending the classes or rejecting the preparations. Additional prenatal variables in pregnant women were the Color Word Test of flexibility-constriction, anticipated use of drugs for delivery, fear of pain in labour and delivery, and attitude toward motherhood. Table 1 shows the variables used and their range of scores in the 1960s US samples. Further details of the 1960s methods are given in Lapidus^{4,9,11}. The Bem¹² Sex Role inventory for US samples in the 1980s, and Hebrew Form, Lapidus¹³, was used in Israel. Perinatal practices of breastfeeding or bottling, and parental care or a 'baby nurse' were also measured in post delivery samples.

Results

Greater psychological differentiation on the Embedded Figures Test of field independence-dependence, and the Color Word Test of flexibility or constriction was found as hypothesized in the Preparation group in the US 1960s samples as seen in Table 2. The results for months of pregnancy and education are seen in Table 3 indicating that these were adequately controlled. The obtained differences in Preparation and Non-Preparation groups in the Lapidus 1960s samples were due to consistent patterns of active mastery or more passive victimization instead of potentially relevant background variables in other studies. The correlations among all variables which are relevant to the 1980s studies, are presented in Table 4. It is seen that the active mastery required to seek preparation, (especially in the 1960s when only 15% of unselected primiparas were participating in such classes, Lapidus^{4,9}), was negatively associated with degree of belief in God, and frequency of prayer attendance. The more passive dependent group was more traditionally 'religious' and conformed more to the cultural pressure to rely on drugs for labour and delivery, and cope with pregnancy information by an avoidant pattern ('what you don't know can't hurt you'), or dependency on the doctors and authorities. These results are shown in Table 4. The dependent, Non-Preparation group had more postpartum rage and depression as predictably related to their level of anticipatory fear and lack of adequate realistic expectations. The Preparation group also showed more active

Table 1. Variables in initial studies. The variables used in the 1960s US study, and later Switzerland samples and their range of scores are as follows:

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1. Criterion: Preparation = 1, Non-Preparation = 0
 2. EPT mean solution time (1.9–187.4 seconds)
 3. CWT III-II difference (4.6–127.9 seconds)
 4. CWT III errors (0–15)
 5. Anticipated use of drugs or preparation (drugs = 1, preparation = 0; from Scale I)
 6. Fear of pain in childbirth (7 point scaled statements on Q sort cards:
 - 1 = not painful at all;
 - 2 = painless with modern drugs or preparation;
 - 3 = moderately painful with modern drugs or preparation;
 - 4 = very painful but bearable with drugs or manageable with preparation;
 - 5 = “I think childbirth is the most painful thing in the world”.
 7. Coping style in reaction to pregnancy and childbirth:
 - 1 = active information seeking;
 - 2 = passive acceptance of information and doctors advice;
 - 3 = avoidance: “the best thing to do is to relax and not worry myself by thinking and talking about it too much.”
 8. Attitude toward motherhood: 5 = “most wonderful joys and self fulfillment...”; 1 = ...“tremendous problems and drudgery.” (Obtained range = 3–5; Scale III)
 9. Plan to breastfeed (yes = 1, no = 0, from interview)
 10. Location of testing-travelled to E’s office (yes = 1, no = 0)
 11. Month of pregnancy when tested (3–9)
 12. Years of education (11–22)
 13. Belief in God (yes = 1, no or agnostic = 0; from interview)
 14. Frequency of prayer attendance per year (0–99; from interview)
 15. Plan to hire a baby nurse (yes = 1, no = 0; from interview)
 16. Childbirth procedure planned not drugs = 0, partial anesthesia (eg. epidural) = 1, full anesthesia = 2; from interview)
 17. Number of children desired (1–8; from interview)
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The subjects who chose a program of preparation for childbirth are called the Preparation group, or P group. The subjects who rejected such a program are called the Non-Preparation group, or N = P group (n = 84, US 1960s Study)

mastery in relation to menstrual functioning, heterosexual pleasure, successful planned pregnancy, life activity such as travelling to the Examiner’s office for the testing instead of staying at their homes, and more active personal involvement with their infants perinatally. The Preparation mothers also more often worked outside the home and chose to breastfeed. Their contraceptive use was most often the diaphragm as opposed to the oral contraceptive pill preferred by the Non-Preparation group. Thus, in the active mastery groups, the apparent paradox or discontinuity was found in their consistently higher levels of active independence, adaptive non-conformity, and personal initiative along with their greater flexibility to make stronger sexual attachments with their partners, and more close physical bonding with their babies through maternal breastfeeding and more father holding, diapering, and active play with babies than in the less differentiated, more passive Non-Preparation samples.

Table 2. Differences between Preparation and Non-Preparation groups on measures of field articulation

Measures	Preparation group		Non-Preparation group		<i>t</i>	<i>p</i>
	Mean	Sigma	Mean	Sigma		
a. EFT	19.08	12.41	86.36	39.94	10.4	< .001
b. CWT II	59.64	12.05	61.42	14.98	0.6	N.S.
c. CWT III	98.41	24.00	110.28	28.56	2.0	< .05
d. CWT III-II	39.61	16.29	48.86	23.04	2.1	< .05
Difference						
e. CWT II Errors	1.02	1.24	1.60	1.69	1.7	< .10
f. CWT III Errors	1.86	2.45	4.95	3.76	4.4	< .001

EFT: Field-Independence-Dependence

a. Mean solution time

CWT: Flexibility-Constriction; Color-Word Test performance measure

b. Reading time Part II (colors alone, or 'coding')

c. Reading time Part III (interference)

d. Mean difference between reading time – Parts III and II

e. Errors on Part II (coding)

f. Errors on Part III (interference)

All *p* values are given for 2 sided tests with 82 degrees of freedom

Follow-up Studies Cross-culturally, Two Decades Later

A sample of pregnant women in Switzerland was recruited from childbirth preparation classes and referrals of non class attenders. They were given the same consent and test forms as the 1960s US samples, except that their preferred language of English, French, or German was used. The results were consistent in that solution time was faster on the individual Embedded Figures Test in the Preparation group, and they more often breastfed their babies, and shared other care with their husbands rather than their mothers i.e. baby's grandmother, or 'nurse', 'nanny', 'housekeeper' who were depended upon more by the Non-Preparation group.

Qualitative data from Antigua, West Indies suggests that the obtained patterns of psychological differentiation, and perceptual field independence-dependence with flexibility or constriction predicts independent patterns of sexuality, coping with pregnancy, childbirth, and perinatal practices cross-culturally, but the individual culture's pressures will vary and specific behaviours and choices will be relative. This will be clarified in the discussion.

US Sample One, 1980s

To test the stability of the findings from the US 1960s samples, and hypotheses resulting from additional studies^{10,11,14} and endocrinology¹⁵, samples of reproductive aged women and men were tested on the Group Embedded Figures

Table 3.

Results on control variables of month of pregnancy and years of education: 1960s US Samples Distribution of month of pregnancy for the total subject sample*

Month of pregnancy when S was tested	Number of subjects		Total
	Preparation	Non-Preparation	
3	1	2	3
4	3	6	9
5	2	3	5
6	11	4	15
7	8	10	18
8	13	8	21
9	4	9	13
Total	42	42	84

* t between Preparation and Non-Preparation groups on mean month of pregnancy when tested = 0.19, non-significant.

Correlations among control variables and the criterion

	Month of pregnancy (v. 11)	Years of education (v. 12)	Number of children desired (v. 17)
Criterion (v. 1)	.02	.12	.19
Month of pregnancy (v. 11)		.11	.21*
Years of education (v. 12)			-.14

* $p < .05$

Correlation between mean EFT solution time and years of education in the Preparation and Non-Preparation groups separately

Group	r	t	p
a. Preparation	-.07	-0.50	N.S.
b. Non-Preparation	-.39	-2.71	< .01

t -Test of significance of the difference between mean years education in Preparation and Non-Preparation groups

Preparation		Non-Preparation		t	r^*
Mean	Sigma	Mean	Sigma		
15.70	1.96	15.17	2.60	0.75	.12

* r is the correlation between years of education and the criterion (Preparation) for the combined sample.

Table 4. Correlation matrix for all variables and differences between groups on active personal involvement

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	-.75	-.23	-.44	.79	.10	-.59	-.25	.66	.41	.02	.12	-.35	.07	-.48	-.89
2		.20	.38	.61	-.18	.49	.34	-.49	-.36	.04	-.29	.33	-.01	.38	.64
3			.61	.18	-.06	.09	.01	-.19	-.16	-.25	-.14	.15	.06	.20	.24
4				.41	-.04	.23	.11	-.31	-.25	-.25	-.24	.22	.05	.23	.43
5					.01	.58	.07	-.61	-.29	-.02	-.07	.37	.01	.43	.82
6						-.04	-.23	-.04	-.10	.01	.21	.03	-.11	.04	.00
7							.11	-.58	-.30	-.01	-.11	.14	-.02	.27	.66
8								-.31	-.24	-.06	-.38	.31	.17	.06	.23
9									.03	.11	.23	.36	.01	.45	.83
10										-.04	.11	-.25	.07	-.25	-.36
11											.10	-.12	-.09	-.22	-.15
12												-.26	-.15	.09	-.19
13													.26	.31	.40
14														-.17	.02
15															.47

For 82 degrees of freedom, $p < .10$ for $r = .18$, $p < .05$ for $r = .21$, $p < .01$ for $r = .28$ (two-sided probability test).

Variables listed are:

- | | | |
|--|---|---|
| 1. Criterion: Preparation | 7. Coping style in reaction to pregnancy and childbirth | 12. Years of education |
| 2. EFT, mean solution time | 8. Attitude toward motherhood | 13. Belief in God |
| 3. CWT III-II difference | 9. Plan to breastfeed | 14. Frequency of prayer attendance per year |
| 4. CWT III errors | 10. Location of testing | 15. Plan to hire a baby nurse |
| 5. Anticipated use of drugs of preparation | 11. Month of pregnancy when tested | 16. Childbirth procedure planned |
| 6. Fear of pain in childbirth | | 17. Number of children desired |

Test, in a repeat measures design¹⁶. It was expected that, as in the 1960s, US women taking the contraceptive pill would be more field-dependent than those not taking the pill. Further, because menstrual functioning can be disrupted by anxiety, and relatively field-dependent persons have more global anxiety than more differentiated S¹⁷, it was predicted^{11,18} that women at midcycle would be more perceptually efficient than they would be during menses. The pill women were expected to show no change in their performance with cycle day, and males were also expected to show a relatively stable performance compared with themselves. The results showed that US pill women correctly located fewer of the embedded figures (the operational definition of field dependence in this study), than more active independent non-pill women as predicted, consistent with the 1960s US samples. However, merely repeating the tests after two weeks, did not provide adequate cycle day control or measures during ovulation as studies by Vollman¹⁹. Full details of this study are given in Lapidus¹⁸.

US Sample Two, 1980s

The second US 1980s sample was tested on repeat measures of the Group Embedded Figures Test, and the Bem Sex Role Inventory to further define the contrast between the cultural definitions of 'passive femininity', and the active biological femininity found in maternal behaviours²⁰ (Newton, 1955), and the pre- and perinatal behaviours of the active mastery mothers in Lapidus^{10,11,14}. This paper presents the perceptual results in relation to the Israeli samples tested with comparable measures in Hebrew^{8,13,21,22}. US pill women in the second 1980s samples were again more field-dependent than their matched non-pill cohorts as predicted and seen in Table 5.

The Israeli Samples in the 1980s

A series of studies of normal men and women and reproductive clinic patients and their husbands or partners were studied in Israel. The normal (controls) were science teachers in a special enrichment training course. The reproductive clinic groups included normal pregnant women and partners taking childbirth preparation classes, and non preparation couples. New couples with primary infertility were invited to participate during their initial evaluations. A group of hormone treatment patients was tested in a counterbalanced repeat measures design²³. A preparation for childbirth class of pregnant women and their husbands was tested in a single session. All Israeli samples were administered the Lapidus battery of pencil-paper tests of demographic information, Sex Role Inventory, Hebrew Group Embedded Figures Test, and the Lapidus²¹ General Information Short Form in Hebrew scored according to Shouval²⁴, as a control for current level of intellectual functioning. The non pregnant clinic samples filled out an ovulation estimation chart constructed by Lapidus in Hebrew based on Vollman¹⁹. In addition, the clinic groups were given the Internal-External Scale²⁵ of self reported locus of control.

Scores in Preparation and Non-Preparation groups separately

T***	Variable	Score	Preparation	Non-Preparation	χ
-11.8***	Breastfeeding (v. 9) no = 0, yes = 1	0 1	3 39	30 12	36.4***
-6.6***	Hire baby nurse (v. 15) no = 0, yes = 1	0 1	28 14	18 34	19.4***

*** $p < .001$ for all differences.

Distribution and differences between active personal involvement

Variable	Score	Preparation	Mean (SD)	Non-Preparation	\bar{x} (SD)
Drugs (v. 5) no = 0, yes = 1	0 1	40 2	.05 (.21)	7 35	.83 (.37)
Coping style (v. 7)					
Active info. seeking	1	39	1.10	12	1.88
Avoidance	2	2	(.37)	7	(.66)
Passive dependence	3	1		7	

Results

Combined samples of Israeli women were comparable to the US samples on the perceptual tests of Embedded Figures, and somewhat older than the US current student samples as seen in Table 5. Preliminary data on perceptual patterns in infertility and reproductively efficient (normal non-pregnant, or successfully pregnant) Israeli women had been consistent with Elings²⁶ findings of a mixture of culturally defined 'masculine' and 'feminine' sex role traits in the more autonomous subjects²⁷. Further, the Lapidus hypotheses of maximum field-dependence in the primary infertility women was dramatically found in the Israeli samples as seen in Table 5. An unexpected striking result on the prenatal contraceptive patterns in the Israelis compared with the current US samples is seen in Table 5. Within the hormone treatment sample of primary infertility, the past oral contraceptive pill users, were dramatically more field-independent than their non-pill cohorts. This finding appeared in every subgroup of Israeli women: the pill users were much more differentiated than the comparable non-pill users. Results for the prenatal preparation pregnant Israelis, compared with the hormone treatment group are also tabled(5). As in the US pregnant samples in the 1960s, the active mastery in preparing to actively participate in labour and delivery is also continued in the perinatal breastfeeding and bonding with the infant.

Table 5. Age, education and group Embedded Figures Test results for 1980s US sample and selected Israeli samples

Variable	US pill ^a women (<i>n</i> = 18) Mean (S.D.)	US no-pill women (<i>n</i> = 18) Mean (S.D.)	T	<i>p</i> (2-tailed probability)	Israeli combined samples women (<i>n</i> = 56) Mean (S.D.)
Age (months)	261.61 (57.16)	213.00 (13.27)	0.70	NS	371.65 (61.33)
Years college	2.18 (1.24)	2.00 (1.10)	0.31	NS	1.79 Total yrs. 13.79 (2.56)
GEFT ₁	9.50 (1.12)	11.00 (4.15)	2.31	.03	9.27 (5.88)
GEFT ₂	12.71 (1.01)	16.83 (0.75)	2.47	.02	13.25 (5.68)
GEFT _{Diff}	3.18 (3.40)	2.83 (4.22)	0.20	.04	2.38 (2.33)

Variable	Israeli Primary infertile no-pill (<i>n</i> = 18) Mean (S.D.)	Israeli infertile past pill (<i>n</i> = 8) Mean (S.D.)	T	<i>p</i>
GEFT ₁	3.56 (2.81)	13.63 3.42	-7.30	< .0001
	Pregnant non-preparation (<i>n</i> = 5) 5.80 (3.26)	Pregnant preparation (<i>n</i> = 13) 12.08 (5.35)	-2.41	< .02
Years education	13.29 (2.87)	14.14 (1.77)	-.75	NS
	Pregnant non-preparation 14.25 (2.87)	Pregnant preparation 15.75 1.25)	-0.84	NS

^a Pill and no-pill women are the second US sample of women using and not using contraceptive pills respectively.

^b No pill and past pill infertile Israelis are primary infertility women who never used the oral contraceptive pill or who did use oral contraceptive pills prior to their unsuccessful attempts to conceive.

^c Pregnant non-preparation and preparation are the 1980s Israeli Non-Preparation and Preparation for childbirth pregnant women respectively.

Discussion

The cross-cultural consistency in prenatal perceptual independence discriminating the more active family planning choices from more passive conformity to the specific cultural pressures, was seen in the US 1960s and 1980s non-pill users,

while Israelis who used any contraceptive were more independent of the reproductive pressure^{28,30}. The most available option in Israel was the pill, followed by the IUD. Only one subject in the Israeli samples reported diaphragm use, and she correctly located 18 out of the 18 embedded figures. The choice of no contraception, in nonconformity with the perceived World Health Organization pressure against teenage pregnancy was seen in Antigua's adolescents who fulfilled their old tradition of proving the girl's suitability for marriage by having a baby first. The choice of anticipatory preparation for childbirth in couples in every country studied was associated with greater active independence perceptually and culturally, than the rejection of classes. Further, the more differentiated the participants were initially, the more successful the training as in other real life coping. Prenatal field-dependence was predictably related to perinatal stress and disrupted parent-infant bonding. The combination of relative passive dependency with lack of preparation for childbirth and parenting, predicted perinatal rage in subjects who had unrealistically glorified the childbirth or minimized the degree of strain in the perinatal period; and depression in those who prenatally anticipated a high degree of pain and stress, and perceived the actual experience as even more helpless victimization as in Seligman³¹. The prenatal patterns of high differentiation and active mastery in parents-to-be, cross-culturally and over the 20 years of his research were found in perinatal practices of breastfeeding, greater personal attachment behaviours with the infant perinatally, and perpetuation of the trust, competence, resilience to future stress (as in Werner's 30 year study of Hawaiian island children³²). It is concluded that the results of these studies could be applied to improvements in prenatal psychology and medicine with contributions to more secure perinatal attachments and possibly cross-cultural improvements in society.

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References

1. Witkin, H. A., Dyk, R. B., Faterson, H. F., Goodenough, D. R., and Karp, S. A. (1962). *Psychological differentiation*. Wiley, New York
2. Reisman, P. (1950). *The lonely crowd*. Yale University Press, New Haven
3. Bell, E. G. (1955). *Inner-directed and other directed attitudes*. Unpublished doctoral dissertation, Yale University

4. Lapidus, L. B. (1969). Cognitive control and reactions to stress: Conditions for mastery in the anticipatory phase. *Proceedings of the 77th Annual Convention of the American Psychological Association* 4, 569–570
5. Rapaport, D. (1967). Some metapsychological considerations concerning activity and passivity. In: Bill, M. M. (ed.) *The collected papers of David Rapaport*. Basic Books, New York
6. Horowitz, M. and Horowitz, N. F. (1967). Psychologic effects of education for childbirth. *Psychosomatics* 8, 196–202
7. Oltman, P. K., Raskin, E., and Witkin, H. (1971). *Group Embedded Figures Test*. Consulting Psychologists Press, Palo Alto
8. Lapidus, L. B. (1987). *A Hebrew form of The Group Embedded Figures Test*. (In Hebrew). Heiliger, Jerusalem
9. Lapidus, L. B. (1968). *The relation between cognitive control and reactions to stress: A study of mastery in the anticipatory phase of childbirth*. Doctoral dissertation, New York University
10. Lapidus, L. B. (1971). Psychoanalytic aspects of female sexuality and preparation for labor and delivery. *Third International Congress of Psychosomatic Medicine in Obstetrics and Gynecology*, London
11. Lapidus, L. B. (1979). Female sexuality: Empirical studies of biological functioning and mastery. In: Carenza, L. and Zichella, L. (eds.) *Emotion and reproduction*. Academic Press, London, pp. 659–667
12. Bem, S. L. (1981). *Bem Sex Role Inventory professional manual*. Consulting Psychologists Press, Palo Alto, CA
13. Lapidus, L. B. (1986). *Hebrew form of the Bem Sex Role Inventory*
14. Lapidus, L. B. (1975). Psychosomatic aspects of labor in relation to perceptual organization in women and patterns of parental practices in the family. In: Hirsch, H. (ed.) *The Family*. Karger, Basel, pp. 442–448
15. Leshner, A. (1978). *Introduction to Behavioral endocrinology*. London, Oxford
16. Lapidus, L. B. (1986). Hormones, perceptual efficiency and sexuality. *J. Psychosom. Obstet. Gynecol.* 6(4), 491–500
17. Lapidus, L. B. and Schmolling, L. B. (1975). Anxiety, arousal, and schizophrenia: A theoretical integration. *Psychol. Bull.* 82, 689–710
18. Lapidus, L. B. (1986). Parenting plusses. *Psychology Today* 20(10), 4
19. Vollman, R. F. (1977). *The menstrual cycle*. Saunders, Philadelphia
20. Newton, N. (1955). *Maternal emotions, a psychosomatic medicine monograph*. Heiber, New York
21. Lapidus, L. B. (1986). *General information short form in Hebrew*
22. Lapidus, L. B. (1986). *Biographical questionnaire*
23. Lapidus, L. B. (1979). Methodology in psychosomatic research. In: Carenza, L. and Zichella, L. (eds.) *Emotion and reproduction*. Academic Press, London, pp. 69–73
24. Shouval, R. *Wechsler Adult Intelligence Scale Items and Scoring Criteria* (in Hebrew). Szold Institute document, Jerusalem
25. Rotter, J. B. (1966). Generalized expectancies for internal vs. external control of reinforcement. *Psychological Monographs* 80
26. Elings, S. (1982). *Psychological androgyny: A comparative study among adolescent city and kibbutz girls with feminine and masculine versions of Bem Sex Role Inventory*. Master of Arts Thesis, Hebrew University, Department of Psychology
27. Lapidus, L. B. (1987). Field independence and sex role integration in reproductive efficiency and infertility. *International Conference on Childbearing and Perinatal Care*, 24. Artzet, Jerusalem
28. Russo, N. F. (1979). Overview: Sex roles, fertility and the motherhood mandate. *Psychology of Women Quarterly* 4(1)

29. Harlap, S. (1979). Multiple births in former oral contraceptive users. *Br. J. Obstet. Gynecol.* **86**, 557–562
30. Harlap, S., Davies, A. M., Grover, N. B., and Prywes, R. (1977). The Jerusalem perinatal study: The first decade: 1963–1973. *Israel J. Med. Sci.* **13**(11)
31. Seligman, M. (1968). Chronic fear produced by unpredictable shock. *J. Comp. Physiol. Psychol.* **65**, 402–411
32. Werner, E. E. (1989). Children of the garden island. *Sci. Am.* **260** (4), 106–111