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Effects of oral contraceptives on daily self-ratings of positive and negative affect

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Abstract

Objectives: The relationship between affect and duration of oral contraceptive (OC) use was investigated. **Method:** Ninety-six women (17 first-time OC users, 34 long-time users, and 45 never-users) completed the Positive and Negative Affect Schedule (PANAS) and the Menstrual Distress Questionnaire (MDQ) daily for 35 days. This study was the first to examine positive affect variability; personal and family psychiatric history; and to compare early-, late-, and never-users of OCs. **Results:** Triphasic users experienced greater variability in positive affect across the cycle, likely due to the variable hormone levels. Withdrawal of a constant level of hormones (monophasics) during early use was associated with greater variability in positive affect than withdrawal of changing hormonal levels (triphasics). Furthermore, personal and family psychiatric history may mediate an effect of OCs on negative affect variability. **Conclusions:** OCs and, therefore, hormones can alter day-to-day affect variability. Four variables are associated with this effect: duration of use, OC type, personal psychiatric history, and family psychiatric history.

Keywords: Oral contraceptives; Positive affect; Negative affect; Hormones; Mood; Survivor effect

Introduction

Mood change remains a controversial side effect of oral contraceptive (OC) use despite a considerable amount of research. Inconsistent findings have been reported both in earlier research, which tended to focus on the incidence rates of diagnosable mood disorders in OC users versus nonusers (see Slap [1], Cullberg [2], and Long and Kathol [3] for reviews of the better studies), and in more recent research (see Oinonen and Mazmanian [4] for a review), which focuses on group differences in affect across the menstrual cycle (e.g., Refs. [5–17]).[1]

Of the 13 prospective studies involving daily affect ratings, all but one [10] found differences in affect between OC users and nonusers. The direction of the differences and the menstrual cycle phases in which they occurred, however, was not consistent across studies. For negative affect, one study [8] reported that OC users experience less negative affect across the entire menstrual cycle, and another [15] indicated higher negative affect for monophasic OC users than nonusers. Other studies [7,10,13,17] found no differences in negative affect at any phase of the cycle. For positive affect, two studies [8,14] found no differences, but one well-conducted study [7] found that OC users rated themselves higher on positive affect than did nonusers.

Only two reasonably consistent findings emerge from this literature. First, OC users report less affect variability than nonusers [9,13,15,16], which suggests that the hormones in OCs might provide some stabilizing effect on mood. Second, OC users report less negative affect than nonusers during the menstrual phase [8,13,15,16], which could indicate that OCs have an indirect pharmacological effect on mood through the reduction of somatic symptoms during menstruation.

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[1] It should be noted that the OCs that are prescribed today differ from those taken prior to the mid-1980s in that most of today's OCs contain lower estrogen doses (<35 μg) and many contain new types of progestin (e.g., desogestrel, norgestimate). However, it is not clear whether estrogen or progesterone is responsible for OC-related mood change [4], and little mood or affect research has been conducted on OCs with the new progestins.

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These inconsistent findings might be attributable, at least in part, to a number of methodological factors. First, subjects taking OCs should be defined as either long-time users or first-time users. Studies that do not make this distinction run the risk of underestimating negative mood side effects because of the "survivor effect" [18]. This refers to the fact that individuals who do experience negative effects when taking OCs are likely to discontinue OC use and explore other methods of contraception. Alternatively, such individuals might change pill type (e.g., from monophasic to triphasic preparations). Thus, long-time user groups are likely to be comprised of women who have not experienced negative effects (i.e., survivors), or women who changed pill type because of negative effects (i.e., "switchers"). Second, independent measures of both positive and negative affect should be included, as OCs have been shown to influence both (e.g., Refs. [7,16]). Third, positive and negative affect *variability* should always be examined. OCs could exert a stabilizing effect on mood (e.g., Refs. [9,13,15,16]), thus, decreasing within-subject variability. Fourth, attention should be paid to individual differences that might serve as vulnerability factors in some women. For example, previous research suggests that a personal history of depression [19,20] and a family history of OC-related depressive symptoms [21] increase one's risk of exhibiting depressive symptoms when taking OCs. Finally, psychological and indirect pharmacological factors that could affect mood should be assessed to determine what role, if any, they may play. Psychological factors may include expectations of a positive or negative mood change (the placebo effect), or "the symbolic effect of the 'antibaby pill'" [22] (e.g., an increase in positive affect or a decrease in negative affect due to increased reassurance about protection from pregnancy). An indirect pharmacological effect might be mood change secondary to somatic side effects (e.g., an increase in negative affect occurring because of weight gain).

The present study attempted to examine the relationship between OC use and affect and to determine whether controlling for the above confounds could account for the conflicting findings of previous researchers. The present study is the first to examine positive affect variability and to investigate the survivor effect by directly comparing early-, late-, and never-users of OCs. It is also the first study of affect to examine a number of additional possible moderating variables. These were presence or absence of: self-diagnosed premenstrual syndrome (PMS) history, family history of mental illness, and personal history of mental illness; as well as the interaction between pill type (monophasic vs. triphasic) and duration of use. PMS was included due to the putative relationship between hormones and mood, while family and personal psychiatric history were included as they could reflect possible vulnerability factors to mood change.

Three main hypotheses were suggested by the literature: (a) first-time OC users should experience higher negative affect and lower positive affect than long-time users and never-users; (b) long-time OC users should experience less variability of negative affect and positive affect than never-users and first-time users; and (c) OC users with the presence of a self-diagnosed history of PMS, family history of mental illness, and/or personal history of mental illness should experience more negative affect and less positive affect than never-users and OC users without such a history.

Method

Subjects

One hundred and twenty-nine female university students (20 first-time OC users, 52 long-time users, and 57 never-users) were recruited to participate in this study. The women received either a monetary payment or course credit (introductory psychology student volunteers) for completing the study.

Data were excluded from analysis if the subject: (a) was a long-time user who had taken more than one brand of OC pill (i.e., "switchers"); (b) was a first-time user who had previously taken OCs and was starting again; (c) had previously delivered a child; (d) had a current and/or chronic medical disorder that could affect emotional states (e.g., hypothyroidism); (e) was pregnant; (f) was presently taking a medication that could affect emotional states (e.g., lithium carbonate); (g) did not menstruate during the 35 days of the study; (h) was lactating; or (i) was hysterectomized. In total, 27 women were excluded based on the above criteria. Six women (one first-time user, three long-time users, and two never-users) did not complete the study (4.7%). Reasons for the loss of subjects included: (a) moving out of town during the course of the study (one first-time user); (b) failure to complete the 35 Daily Rating Questionnaires (DRQ) (three long-time users); (c) illness following surgery (one never-user); and (d) failure to complete Stage 3 due to a busy schedule (one never-user).

In total, 96 women (17 first-time OC users, 34 long-time users, and 45 never-users) completed the study and had usable data based on the exclusion criteria. The women ranged in age from 18 to 27 ($M = 19.84$, S.D. = 1.59) and their years of education ranged from 13 to 19 ($M = 14.41$, S.D. = 1.01). The majority of the women were single; only 7.3% were married or cohabitating. Of the OC users, 54.9% were taking monophasic preparation and 45.1% were taking triphasic preparation OCs. Eight monophasic preparations (Minestrin 1/20, Marvelon, Ortho-Cept, Min-Ovral, Loestrin 1.5/30, Demulen30, Cyclen, Brevicon) and five triphasic preparations (Synphasic, Ortho 7/7/7, Tri-Cyclen, Triphasil, Triquilar) were being taken by the women. The first-time user group consisted of women who had begun taking OCs for the first time within the previous 60 days. These women had been taking OCs for a mean of 1.00 month (S.D. = 0.79). The long-time user group included women who had taken one brand of OCs for more than