Affect-Cognition Relationships in Adolescent Diaries: The Case of Anne Frank

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Abstract. The adolescent diary of Anne Frank was examined for evidence of changes in emotional expression (measured by density of categories of emotion), in cognitive level, and in the relation between the two. Increases in emotional density lasting for several days preceded major shifts in cognitive level from an absence of abstract reasoning to absolute, absolutel/relativistic, relativistic, and emerging dialectical reasoning. The emotional peaks were associated with normative issues such as autonomy from parents, menarche, and peer relations. In contrast to the results of short-term studies that claim to show that emotion has no role or an oppositional role in cognitive development, results of this psychobiographical study suggest that passion precedes and may facilitate the development of abstract thought during the adolescent period.

'Adolescence ... is a physiological second birth ... Passions and desires spring into vigorous life, but with them normally comes the evolution of higher powers of control and inhibition' [Hall, 190411975, p. 68]. Hall's eloquent description of emotional change as a motivator of cognitive change has received almost no support from empirical examination of adolescent development [Bandura, 1964; Offer, 1969]. If there is a romantic, Goethe-esque struggle, it has been successfully hidden from the inquiries of social science. There is no evidence that adolescence is a critical period of change in emotional expression or that it is a critical period for change in the relation between systems of cognition and affect. Yet, there is little evidence that would lead to dismissing the orig-
nal concept. The present work opens the case for affect-cognition interactions during the adolescent period, capitalizing on new developments in the study of cognition and affect.

Models of Emotion-Cognition Relations

Oppositional Models

The vacuum of research on adolescent emotion development and on the relations between cognition and emotion exists in part because of deficits in the emotion literature. Current knowledge about the effect of emotion on thought is severely restricted. Although there are several approaches to the problem of emotion and cognition, most suggest that emotional forces are antagonistic to development, especially cognitive development. A variant of this general oppositional model is provided by arousal models of emotion [Solomon and Corbit, 1974]. These predict that there are optimal levels of emotional arousal and that being below or above some optimum is disruptive. Other models assume that emotional reactions arise from cognitive expectations [Schachter and Singer, 1962; Lazarus, 1982]. They argue that emotion is a symptom of cognitive change.

Nonoppositional Models

Alternatives to the prevailing oppositional models exist. For example, Zajonc [1980] has suggested that emotions lead to primitive attentional processes, such as preferences. However, predictions are not made about complex cognitive processes or about developmental processes. While Tomkins' [1962] theory provides impetus for presuming that different emotions may serve as motivators for different types of cognitive processes, there are no simple developmental predictions. In the same vein, Isen's [1984] research indicates that varying mood will alter memory and organizational strategies. But once again the cognitive developmental implications are not set forth. Hall [1904] seems to be alone in his expectation that heightened emotion or passion (biologically determined in the case of adolescence) will precede qualitative cognitive shifts.

Predictions about Development by Different Models

Each of the basic models of the relation between affect and cognition leads to a different prediction about emotion and cognition as developmental systems. For example, following the oppositional models, during periods of increased emotional expression there should be regression to lower levels of thinking, possibly repetitive ruminations. More emotion would mean less thought. Following nonoppositional models such as those of Isen, or possibly Tomkins, changes in particular emotions would lead to organizational or attentional changes, but no developmental change is expected. Happiness would lead to one type of thought organization and sadness to another, regardless of development. Following the arousal models, both high and low degrees of emotional expression would lead to regression in the level of thinking. Only Hall anticipated that the increased expression of emotion or passion would lead to superior thought. Finally, of course, it is still possible that there is no discernable connection between affect and cognition.

It is difficult to test models of the relation between highly variable factors such as cognitive or affective systems. Using cross-se-
tional data, one may show general progress across adolescence in cognition [Broughton. 1978: King & 31. 1983: Inhelder and Piaget, 1958: Labouv-Viey. 1982: Selman. 1980]. Likewise, one could demonstrate general shifts in repons of emotionality [Stapley. 1987: Stapley and Haviland. 1989: Csikszentmihalyi and Larson. 1984]. However, discovering that increases or decreases in one system precede, succeed, or accompany changes in the other system is improbable using cross-sectional group data. Shifts in either cognition or reports of emotion could proceed at different rates on different issues for different individuals. There could be critical developmental periods or critical developmental issues. The length of time that should be examined is unknown. Finally, since both Piaget [1981] and Tomkins [1962] imply that the content issues around which relevant changes might proceed may be highly individual, investigator-designed questionnaires would appear of very limited usefulness.

The Ideographic Approach

To begin inquiry in this area, an ideographic approach is needed. Recent advances in the use of psychobiographical methods [McAdams, 1988] suggest that this is the ideal approach for material in which simple causal chain predictions are not available. The psychobiographical method, though not previously applied to the analysis of cognition, has been used with emotional material [Haviland. 1984].

We plan a series of psychobiographic studies of emotion and cognition. This, the first, focuses on two questions: (1) Do emotion shifts precede cognitive shifts, or vice versa? (2) What is the effect of emotion expression on cognitive level? A related second study [Kramer and Haviland. 1991] focuses on the development of pathology in adolescent cognition and emotion.

It is common to offer an apology for presenting a single case to the scientific community, even when the argument for nonlinearity and nonadditivity is presented. Yet, it has been pointed out in defense of the methodology that the single case is simply an example of a special population. Rosenberg [1989] states:

An idiographic analysis can also facilitate the search for ... general explanatory principles .... Even the typical empirical study involving a sample of subjects ... is, in a strong sense, an ideograph since there are inevitably particulars associated with the sample as a whole ... (I): is the ongoing enterprise of developing a cohesive body of theory and knowledge that yields an understanding of the phenomena [po 41 8].

Our data are taken entirely from Anne Frank’s [1953] adolescent diary. Diaries are, of course, continuous records usually over a lengthy period of time. Although adolescent diaries may contain the usual age markers of concern in research on adolescence, such as physiological change, peer relations, school achievements, family climate, and so forth, they include much more material. They contain the continuous reflection by the adolescent on these events. Because of this, they provide unrivaled information on naturally occurring changes in cognitive processes and emotional reaction, in response both to traditional developmental markers and highly personal ones. In the course of everyday thinking, if adolescents change their mode of cognitive processing, it should be reflected in their diaries. If some changes occur rapidly, others slowly, this should be revealed. There is no imposed timetable.
The research described in this paper examines the associations between types of cognitive statements and the density of emotional expression within the text of Anne Frank’s diary. The entire diary was coded independently for emotion words by the first author and for level of thinking by the second author.

Anne Frank’s [1953] Diary covers a period from June 14, 1942, 2 days after her 13th birthday, to August 1, 1944, shortly after her 15th birthday. The entries are fairly continuous; rarely does she miss more than a week without writing. Her intention was to share her life with a secret friend, her diary. During the period of the diary she was in a hidden annex with her parents, sister and a few family friends seeking to hide from Nazi persecution.

Although Anne was writing under desperate circumstances, she herself was a bright, empathic, energetic adolescent with an understanding and loving family. Anne Frank died during adolescence at the end of World War II in a concentration camp. We use her legacy gracefully to provide insight into the interconnections between emotion and thought during the passionate period of life called adolescence.

**Method**

**Assessing Cognition**

To assess cognitive development we use an adaptation of the Piagetian [Inhelder and Piaget, 1958] approach. There is evidence that when the thinking of adolescents is coded in this way, cognitive structures appear that conform to a developmental sequence [Basseches, 1980; Blanchard-Fields, 1986; Broughton, 1978; Chandler, 1987; King et al., 1983; Kramer, 1983; Kramer and Woodruff, 1986; Labovivie-Vief, 1982; Pascual-Leone, 1983; Perry, 1970; Sinnott, 1984].

The developmental model adorned here follows the thinker through three levels: absolute, relativistic, and dialectical thinking. Absolute thinking [derived from Pepper’s, 1942, analytic world views of formism and mechanism] posits a belief in a fixed, stable world, to which consciousness has direct access, either through reflective abstraction or scientific experimentation [Kramer, 1983]. The absolute thinker is prone to categorize people using traits and types seen as inherent and fixed, and to think in terms of absolute principles and ideals. This mode of thinking probably develops in early adolescence. There are parallels to absolute thinking in the constructs of dualistic thinking [Benack, 1984; King et al., 1983], irrasystemic thinking [Labouvie-Vier, 1982, late formal thinking [Pascual-Leone, 1983], and universalistic formal thinking [Basseches, 1984]. For example, early in the diary [p. 31], Anne writes: ‘You only really get to know people when you’ve had a jolly good row with them. Then and only then can you judge their true characters.’ The absolute quality of these sentences comes out in the assertion that there is one way to get ‘true access’ to someone’s absolute character.

Relativistic thinking derives from the assumptions of Pepper’s [1942] contextual world view. which posits a changing, unknowable world. Consequently, all knowledge is subjective and constantly changing within fluctuating contexts. Contradiction is accepted as inherent and irreconcilable; thus, it is difficult to make decisions and commitments. This conception of relativism is similar to those proposed by Basseches [1984] and Chandler [1987]. Relativistic thinking begins to emerge during early to middle adolescence. It finds parallels in the constructs of dogmatism/skepticism [Chandler, 1987], intersystemic thinking [Labouvie-Vier, 1982], multiplicity [Benack, 1984; King et al., 1983; Perry, 1970], and predialectical thinking [Pascual-Leone, 1983]. For example, in the middle of the diary [p. 131] Anne writes: ‘I ... pitied myself very much. but that, too, is understandabk...'

Finally, dialectical thinking develops from an attempt to integrate absolute and relativistic concepts,
in order to find continuity within change, and to make commitments within plurality. Like relativity, it construes all phenomena as changing and contradictory. However, it provides order and direction to the change, and treats contradictions as apparent, rather than real, and as the impetus for growth through resolution [Kramer, 1989]. Knowledge through resolution of contradiction is seen as evolving through increasingly integrated structures characterized by emergence (novel features) and reciprocity (systemic characteristics). For example, Anne writes: 'It seems as if you grown up a lot since my dream the other night ... I am much more of an independent being ... I suddenly see all the arguments and the rest of it in a different light ...' [po 125]. This passage reflects a level slightly beyond relativism in that there is a sense of development, some notion of progression to a state of greater independence. which one might see as evidence of dialectical thinking, rather than simple relativity.

While strong forms of dialecticism only emerge after adolescence, Kramer [1989] posited an adolescent form of dialectical thinking, called static systems. Even though the static systems level lacks an awareness of the evolving nature of systems, it shows an awareness of systems principles. Dialectical thinking finds some parallel in *autonomous thinking* [Labouvie-Vier, 1982], commitment within relativity [Benack, 1984; King et al., 1983; Perry, 1970]. relativistic operations [Sinnott, 1984], and what Basseches [1984] and Pascual-Leone [1983] also refer to as dialectical thinking.

**Assessing Emotion**

There is less precedent for a system of emotional expression that is amenable to use with diary material. The most highly developed systems of measuring emotion deal with bodily and facial expression or simple word definitions [Buss and Plomin, 1975; Ekman and Friesen, 1971; Haviland and LeLwica, 1987; Haviland and Walker-Andrews, in press: Izard, 1977; Tomkins, 1962]. Little is known about the typical meanings of expressed emotion in writing or speech, but it is apparent that appropriate relationships exist. Depressed people use depressed affect terms [Beck, 1967]. Emotionally repressed people are sparse in their emotion vocabulary. Gender differences occur in usage [Sommers and Scio1, 1986]. A manic-depressive such as Virginia Woolf shifts rapidly between polar opposites [Haviland, 1984]. These written emo-

tion statements seem to symbolize motivational state.

The method applied in the present study relies on a prior diary study [Haviland, 1984] in which a simple coding schema was used. Assuming that the use of emotion terms reflects individual sensitivity to cultural gestures and personal style, as well as immediate emotional crisis, both conscious and subconscious, we focused on simple emotion words. alone and in combination with other psychologically important elements. Stich a direct approach leads to summations of types of emotion that are predominant at particular times or in relation to particular people, events or thoughts. Sections of a diary can be dominated by particular emotions. They can be dense or sparse in variety of emotion. This focus on the frequency and breadth of emotion vocabulary is only a methodological beginning. Lane and Schwanz [1987] have noted that research must begin in this area, but no detailed study based on more complex methods has been presented.

We must be cautious given the fact that writing about emotional experiences is not the same as the experience itself. Much of an emotional experience is not easily accessible and may be distorted either by repressive Techniques or by individual modes of evaluation. The mood of the individual at the time of reporting may color the report of the earlier mood as well. It is possible that the physical or subconscious expressions of emotions do change during the adolescent, but that self-monitoring produces an intellectualized facade of continuity. We cannot discount the possibility that stability in the emotion expression masks real changes beyond those we observe.

Yet, there are reasons to believe that the diary report in Anne Frank's case is relatively veridical. Some of the entries were obviously written during an emotional episode, for example. while 'furious' with Mummy. Even when the report is retrospective, it is possible that writing about the past-emotional episode recreated the emotional experience [Bensle, 1989].

**Coding Emotion**

All emotion words in the texts were identified. Searches were conducted by computer and by the first author. Whenever the author identified an emotion word or variant of the word not in the search vocabulary, it was added to the vocabulary and researched throughout the text. All words were then matched to the dictionary list provided by Izard [1971] to form
the following categories: interest-excitement, enjoyment-joy, surprise-startle, sadness-anguish, disgust-contempt, anger-rage, shame-humiliation, and fear-terror. One residual category was added, moods in general. This accounted for nonspecific mood words such as 'moody' or 'feelings'.

Words were listed in order of appearance in the text and tagged by both page and date of diary entry. They were also tagged by the person, object, or idea that is the referent of the emotion and, where appropriate, the event referred to.

**Coding Cognition**

The method used was derived from the coding system developed by Kramer and Woodruff [1986]. Every sentence in the diary was examined to determine whether it represented - either alone or in conjunction with other sentences - one of the three cognitive categories - absolutism, relativism, or dialectic. The criterion for inclusion as a cognitively coded statement was that the statement conveyed an absolute, relativistic, or dialectical assertion. As such, the unit of analysis could be a phrase, a sentence, or multiple sentences. Some smaller idea units expressing a complete absolute, relativistic, or dialectical assumption were found to be embedded in a larger passage expressing a different absolute, relativistic, or dialectical assumption. In this case, the smaller unit received one code, while the embedding passage received another. For example, a clearcut dialectical sentence (conveying, for example, the idea of reciprocal causality) might be embedded within a longer relativistic passage expressing a distinct assumption (for example, that there are no absolute truths). If two adjoining sentences represented, for example, relativistic themes, then each was coded as relativistic. If, however, neither sentence alone expressed a relativistic theme, but both together did so, they received one code. The many sentences that received no code were concrete and descriptive, e.g., 'Yesterday was Peter's birthday. He was 16. He had some nice presents. Among other things a game of Monopoly, a razor, and a lighter' [p. 42].

A second trained rater independently coded 25 pages (about 25% of the codable diary). Percentage agreement on the main categories of absolute, relativistic and dialectic thought was 70%. Only 6% of cases consisted of disagreements between the absolute and dialectic categories. These values are similar to those obtained in other work using the same scoring system [Kramer et al., 1991], as well as to those obtained by investigators using other qualitative scoring systems [Labouvie-Vief et al., 1989; Loevinger and Wessler, 1970].

In addition to the three main categories, there appeared a fourth, transitional category. It reflects a thought process Chandler [1987] defined as defended realism. It is not completely relativistic because it presents differences only as linear degrees of differentiation from an absolute stability and objectivity, but it seems to be a step beyond absolutism. We labeled this absolute/relativism. Absolute/relativism proved unreliable in coding. Yet, it may prove useful in further research or in relating this system to other coding systems [Chandler, 1987]. As its inclusion does not affect the direction or overall impact of the results, it was retained for its possible future utility. In all cases the code assigned by the original rater was used.

**Results and Discussion**

**Emotional Expression**

The expression of emotion in the diary must be considered from several perspectives. First, to find out if Anne Frank, who was not living a normal adolescent life, had emotional experiences that were similar to those of ordinary adolescents, we compared her diary entries with general survey data on adolescent emotionalexpressivity. Second, we considered long-term stability or change in emotion, to address the question of adolescent developmental changes in emotional expressivity. Third, we considered the content of precipitating events for dense emotional expression. This also has a bearing on the nonnative question about the Anne Frank diary, i.e., whether she was responding to normal adolescent developmental issues or those brought on by her unusual circumstances.

The emotions reponed by Anne Frank are very similar to those reported in current survey studies of adolescents [Stapley, 1987;
Stapley and Haviland, [1989]. In her diary, there are 684 emotion entries. The density of emotion entries remains fairly constant. In the first half of the diary, 9 emotion words occur per 1,000 words (3 per page): in the second half 3 emotion words occur per 1,000 words. The most frequent categories for Anne are enjoyment-joy (16%) and sadness-anguish (20%); fear-terror (14%) and surprise-startle (5%) together account for another equally large proportion of entries. The hostile emotions of anger-rage (12%) and disgust-contempt (4%) together account for another substantial proportion of emotion words. Remaining categories and percentages are interest-excitement (6%), shame-humiliation (5%) and moods-in-general (8%).

Emotional Experiences. Young adolescents report that their own emotions are likely to be elicited by family events, but as they move to mid-adolescence, they are more likely to reenact peer relations and finally even abstract ideas as eliciting emotion [Stapley, 1987; Stapley and Haviland, 1989]. This progression is seen in Anne's diary. At age 13 (in the first third of the diary), Anne attributes emotion almost equally to herself, family members, and others (including peers): emotions related to ideas only account for 7% of her entries. The following quote is typical of an early entry in which Anne describes her own emotion in concrete terms:

I had to laugh too ... I jumped for joy ... The poem was finished and was perfect ... Luckily Keptor saw the joke ... [p. 6f., italics added].

Mention of family members' emotions declines steadily (from 29 to 16 to 8% across thirds of the diary). Mention of emotions related to ideas increases steadily (from 7 to 11 to 18%). An example of this use of emotion is seen in the following quote from near the end of the diary:

... enjoy nature and the sunshine ... recapture happiness in yourself and in God. Think of all the beauty in and around you and be happy ... And whoever is happy will make others happy too. He who has courage and faith will never perish in misery [p. 154, italics added].

References to self and to others, including peers, remain relatively stable at about 39% for self and about 31% for others. It is probable that the amount of peer discussion is restricted due to the unusual circumstances. However, Anne is able to compensate somewhat by imagining interactions with old friends, by using the diary as a friend, and, finally, by turning to Peter, her only available peer.

Stability versus Change in Emotion. The total number of emotion expressions and the proportions of each type of emotion remain quite stable across thirds of the diary. Positive emotion words account for 38, 40, and 34% of the emotion entries in consecutive thirds of the diary. Hostile emotion words account for 14, 14, and 18% of the entries in consecutive thirds. There is some decrease in the fear-terror category after the initial adjustment to the annex, and a corresponding increase in the sadness-anguish and mood-in-general categories. The sadness-anguish category increases from 26 to 39% and then decreases to 35%, while the fear-terror category decreases from 22 to 7% and then returns to 13%. The stability in emotion over time shown in the diary is also similar to that found among present-day adolescents [Stapley, 1987]. It is also similar to the stability found in a diary study of the adult Virginia Woolf [Haviland, 1984].
The diary approach permits analysis of significant short-term perturbations, as well as degree of stability. For example, there are short periods of intense fearfulness reported in Anne's diary. These result from immediate threats of discovery and Nazi persecution. However, these experiences do not much color Anne's interactions with others or her own course of development based on our analyses. We had expected that the fear-terror category would become associated with a wide variety of events and people over time and that fearfulness would become an important metaphor for life scripts [Tomkins, 1979]; however, this expectation was not supported. Fearfulness remained selectively related to the obvious threat and did not cross the boundaries to other areas of Anne's life while she was in the annex.

Precipitating Events. In general, episodes of emotional reporting are tied to meaningful social and personal events or topics. For example, a period of peak emotional expressivity is associated with the onset of menarche and another is associated with falling in love with her one available peer. Others are related to issues of autonomy with her mother and finally with her father. Within short periods of time, several emotions may be expressed, giving an impression of short-term elaboration of emotional experience or of emotional lability.

It is not, apparently, the frequency of emotion expression that changes during adolescence. Adolescents do not become 'more' emotionally expressive, nor do they come to emphasize certain negative emotions over positive ones. It is the focus and functions of their emotional experiences that change dramatically [Haviland et al., 1990]. When the quality or density of emotion changes over a long period of time, it may be an indication of pathological development [Kramer and Haviland, 1991].

Cognitive Change

The number of coded cognitive statements increases 4-fold over the period of writing. Dividing the diary into 5 equal segments illustrates the rate of increase. In the first segment about 0.8 codes occur per page, then 1.2, 2.5, 2.4, and finally 3.3 in the final segment. In addition, shifts occur in the type of thinking shown. As seen in figure 1, three major shifts occur. The first occurs between pages 40 and 50 and is represented primarily by the emergence of absolute thinking. Prior to this point, the writing is simply descriptive. Starting at about page 100, absolute/relativism increases in incidence, and there is a small incidence of dialectical thinking. Finally, in the last 40 pages, there is a decrease in the proportion of absolute/relativism and an increase in relativistic statements, with a corresponding increase in the incidence of dialectical statements.

First Shift. Early in the diary, Anne's thinking is largely concrete and descriptive. After the first 50 pages, there is an increase in coded cognitive statements, predominantly absolute thinking (fig. 1), supporting the prediction that absolute thinking may emerge in early adolescence [Kramer, 1989] and consistent with other research on social cognitive development [Bernstein, 1980; Broughton, 1978; Damon and Hart, 1982; Montemayer and Eisen, 1977]. The events that are the concern of this shift are peer relations and autonomy from mother.

Second Shift. Following the second shift, Anne exhibits nearly as much relativistic as
absolute reasoning (fig. 1). The event associated with this shift is the onset of menarche. The equal propensity toward the two modes of thinking is also reflected in a high degree of transitional absolute/relativistic statements (not displayed in fig. 1). The general characteristic of this second shift seems to be transitional and represents a differentiation between absolute, objective truth and subjective truth and appearance, a transition found in other studies [Broughton. 1978; Chandler. 1987; Selman. 1980]. The onset of menarche may well elicit a sense of relatively different subjective selves, although other experiences create additional opportunity for differentiation.

Anne shows a budding awareness of the subjectivity of knowledge, but always in contrast to some 'objective' truth. For example, she attempts to understand her difficult relationship with the Van Daan family. At this juncture she attributes some of her own negativity to her parents' interactions with the Van Daans and states:

I want to examine the whole matter carefully myself and find out what is true and what is exaggerated. Then if I myself am disappointed in them. I can adopt the same lines as Mummy and Daddy; if not. I shall try first of all to make them alter their ideas and if I don't succeed I shall stick to my own opinions and judgment [p. 126].

This statement illustrates the dichotomy between objective and subjective so common in Anne's diary, and very common among adolescents in general. She appears to
be relativistic in that she acknowledges that she and her parents might not share the same views. However, the absolute context in which she frames this dichotomy is evident in her absolute view that one interpretation is correct and that the correct side should educate the other side. This transitional position is common throughout the middle of the diary.

During this phase Anne makes some very unambiguous relativistic statements, but then makes a resolution statement at an absolute, or absolute/relativistic level. The contradictory nature of her ruminations is most evident in her relationship with her mother. In the following excerpt she is on the verge of relativistic thinking, but her cognitive/emotional structure is not entirely equipped to assimilate the relativity of complex social interactions:

'I have been trying to understand the Anne of a year ago and to excuse her, because my conscience isn't clear as long as I leave you with these accusations, without being able to explain, on looking back, how it happened ... I suffer now - and suffered then - from moods which ... only allowed me to see the things subjectively, without enabling me to consider quietly the words of the other side ... I used to be furious with Mummy, and still am sometimes. It's true that she doesn't understand me, but I don't understand her either ... The period when I caused Mummy to shed tears is over. I have grown wiser and Mummy's nerves are not so much on edge [po 114].

But in the next diary entry, Anne returns to the same subject, her mother, and once again comes to an absolute conclusion: 'Now it is suddenly clear to me what she lacks.' She concludes that her mother wants to be a friend and that this is a fault. There is only one way to be an ideal mother: 'I need my mother as an example which. I can follow' [po 115].

The excerpt above begins on a relativistic note, describing the different Anne of a year ago, one who must be viewed in the context of who she was then. It moves to absolute/relativism with its distinction between subjective and objective. The whole passage has the flavor of a dichotomy between subjective and objective realities. But finally Anne returns to an absolute, idealistic conclusion about her mother. The active constructive nature of the process of expanding her absolute conception to explore the role of subjectivity in relationships is quite clear in her reflection.

Third Shift. The third shift is primarily characterized by the emergence of dialectical reasoning (fig. 1). Much of Anne's dialectical thinking concerns social relationships and her own identity. She shows a primitive awareness of personality systems, whereby overt appearance is connected to underlying needs, in an intentionally, though not always consciously, oppositional manner. Such a transition has also been observed elsewhere [Broughton, 1978; Selman, 1980].

Much of Anne's dialectical thinking emerges from reflections on her relations with a male peer - Peter - as well as reflections on her own personality and how it is perceived by others:

He clings to his solitude, to his affected indifference and his grown-up ways. but its just an act, so as never, never to show his real feelings. Poor Peter, how long will he be able to go on playing this role? Surely a terrible outburst must follow, as the result of this superhuman effort? [po 150].

Two dialectic trends are evident here. Both trends represent the dialecticism of opposites - every event brings about its own antithesis. In the first part of the quote, outer behavior is perceived to be in purposeful
opposition to inner feelings. In the latter part of the quote, suppression of behavior is seen as eventuating in its antithesis - an explosion.

A caveat must be noted with regard to this final shift in thinking. To the extent that it is dialectic, Anne's thinking is limited. It refers to static systems and does not as yet recognize the potential for the dynamic, evolutionary nature of personality systems [Kramer, 1989]. Furthermore, even in these dialectical responses, there is always a hint of absolutism, as the inner self is deemed more 'true' and objective and given greater credence than the outer self. Thus, her dialectical reasoning, even at the static systems level, is not fully articulated.

Combination of Levels. It is clear throughout the diary that Anne does not operate at anyone cognitive level exclusively. During a single time period she thinks at different levels in different domains. Much of Anne's thinking about herself evolves rapidly from static to relativistic and dialectic. In contrast, much of her thinking about her parents maintains absolute overtones throughout the diary - despite her repeated attempts to develop a more complex understanding of their relationships. Thus, she is likely to operate on multiple levels simultaneously. This fact highlights the complex and dynamic nature of cognition, as it enables effective anticipation of and reaction to highly arousing events and crises. A structural model of cognition allows exploration of different levels of function in diverse situations. One need not posit total consistency in order to be able to describe systematically the emergence and functioning of different modes of thought.


In spite of a pattern of multiple-level usage, there occurs in Anne's diary a regular sequence of cognitive change: supporting the theoretical predictions of our own study as well as others' work (King et al., 1983: Perry, 1970]. Anne, herself, in rereading earlier diary entries, finds it hard to comprehend her younger self and notes remarkable changes. Yet, when forays are made into a new cognitive level, there occur frequent returns to the previous level. Problems may be considered in the light of a new level of thought, but the conclusion still often involves a return to a simpler level. Even so, the overall result is that earlier levels are eventually rejected as uncharacteristic of the self, while new levels become dominant.

Emotion-Cognition Relations

Emotion entries also appear in figure 1. The occurrence of one emotion at a high rate across several entries was associated with the occurrence of several emotions at a high rate in our data. For this reason, we decided to concentrate on emotional density as a summation of passion [Hall, 1904; Stapley and Haviland, 1989: Haviland et al., 1990]. Each rise in passion is related to a normative adolescent developmental crisis - menarche, autonomy from mother, falling in love, autonomy from father. Examination of figure 1 shows that the emergence of each new type of thinking is preceded by a period of peak density in emotion. Every rise in passion is followed by a rise in cognitive processing. To further demonstrate this relation, the correlation of number of emotion entries and number of cognitive entries occurring within the same 1 O-page section was compared to the correlation between number of emotion entries and number of cognitive entries in the following IO-page entry. The better relation is found between a set of emotion entries and the cog-
Table 1. Relations between specific emotions and cognitive level

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Level of cognition</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Enjoyment-joy</td>
<td>52</td>
</tr>
<tr>
<td>Sadness-anguish</td>
<td>34</td>
</tr>
<tr>
<td>Anger-rage</td>
<td>58</td>
</tr>
<tr>
<td>Fear-terror</td>
<td>19</td>
</tr>
<tr>
<td>All emotions</td>
<td>34</td>
</tr>
<tr>
<td>No emotions</td>
<td>32</td>
</tr>
</tbody>
</table>

Levels = Absolute; level 2 - absolute/relativism; level 3 - relativism; level 4 - dialecticism.

Entries are the relative proportion of each emotion occurring in association with each type of cognitive code, i.e., 52% of the enjoyment-joy entries that are associated with any cognitive code are associated with absolute thinking.

Negative entries that follow it \((r = 0.72, p < 0.001)\), although emotion and cognition during the same period are also related \((r = 0.61, P < 0.01)\). The opposite correlation between a cognitive rise and a subsequent emotion rise is nonsignificant \((r = -0.24)\), demonstrating that a rise in cognitive statements does not generally precede emotional expression.

A second way to analyze the interplay of cognition and emotion is to compare the frequencies with which emotion is expressed alone, cognition occurs alone without emotion, and emotion and cognition occur together. It might be argued from the prior correlational analysis that emotion and cognition are independent - that a person refers to events emotionally or in a problem-solving mode. If, on the other hand, emotional associations are somehow prompting cognitive constructions, then they might be closely associated during an early period when the cognitive constructions need support or prompting.

Although the scoring of emotion entries and cognitive level proceeded independently and used different types of scoring systems, it was possible to return to the text and match the density of emotion terms with cognitive level. Each statement that had received a code for cognitive level was tagged and examined for the inclusion of an emotion entry. This was done rigorously, including only cognitive statements with an emotion example in them and cases in which the immediately prior sentence was an emotion statement. Emotion terms occurring more than one sentence distant from the cognitively coded passage were not included.

As reflected in figure 2, emotional expression occurs without cognitive reflection early in the diary, but becomes closely associated with it in the middle of the diary. Only subsequently do cognitive statements begin to appear without accompanying emotional expressions. Since across the diary the total number of emotion words per page remains relatively constant while the number of cognitive statements increases, if the two were in fact independent, the absolute number of times that the two occurred together would rise across the 2 years of the diary, despite their independence. However, this is not the case. The proportion of cognition-emotion entries (to total cognition entries) declines across quarters, from 81 to 84 to 71 to 56% \((\chi^2 = 31.64, P = 0.001)\). This decline indicates that when cognitive constructions are first used, they are more likely to occur with accompanying emotion than they will later in the diary, when cognitive constructions may appear separated from emotion (fig. 2).
Specific Cognition-Emotion Relations. It is possible that particular emotions have a tendency to elicit different types of cognition. As shown in table 1, each cognitive category occurs as frequently in the absence (no emotions) as in the presence (all emotions) of emotion. However, when specific category of emotion is examined, significant associations between emotion and cognitive level appear. The enjoyment-joy, anger-rage, and fear-terror categories differ significantly from cognitive entries with no emotional association, $\chi^2 = 19.8, p \sim 0.0001$; $\chi^2 = 21.3, p \sim 0.0001$; $\chi^2 = 9.6, p \sim 0.025$, for the three categories, although the sadness-anguish category does not. Therefore, there is some support for the hypothesis that particular emotions elicit specific cognitive modes.

Both the enjoyment-joy and anger-rage categories are related to absolute thinking in the diary. This finding seems reasonable if one considers that joyfulness [Berlyne, 1969; Sroufe and Waters, 1976] is a response to a final solution. One has a problem, resolves it absolutely, and is happy. In anger, one is probably inclined to justify, accuse, or defend. If any abstract cognitive process at all were to occur with anger, it is likely to be in the service of singling out absolute assertions.

The fear-terror category is associated with relativism [Kramer and Haviland, 1991].
There may be an element of severe doubt and comparing of possibilities, but no possible solution, in fearful experiences. All cognition categories declined slightly during episodes that reported intense fearfulness. Intense fearfulness may reduce advanced types of cognitive processing. This may reflect a defensive maneuver (strict denial) to place boundaries on the fear-terror category of experience so that it will not invade other areas of life.

Simple sadness (not depression, anxiety, or loss of esteem), as reflected in the sadness-anguish category, seems to be a reflective position, one inclining the individual to dialecticism. Sadness and anger often occurred together, and the association of dialectical thinking with anger as well as sadness may reflect a particular ideoreactive stance within Anne Frank [Tomkies, 1979].

Conclusions

Anne Frank, in spite of the threatening situation in which she lived, usually wrote about normative issues in her diary. Her family and possibly her age protected her from focusing exclusively on thoughts about the fate of family and friends and her own eventual fate. In her contemplation of developmentally important issues, she was still a young adolescent. Important issues to her were restructuring family relations [Steinberg, 1981], finding a suitable peer to love [Sullivan, 1953], and discovering her Own identity [Erikson, 1950].

Based on the present work, Hall [1904] seems to have been correct in his prediction about emotion and cognition. Spurts in cognitive processing during the adolescent period are preceded by spurts in emotional density. These in turn accompany important adolescent issues. There are two types of evidence for this in our study. First, there are time-lagged correlations between individual event-based spurts in emotional density and frequency of cognitive statements. Second, over the entire diary there is an increase in cognitive statements occurring with emotion before cognitive statements begin to occur frequently without emotion. The cognitive spurts are not merely quantitative changes in attention to certain issues, but are also qualitative advances in cognitive development. Cognitive change is seen in the sequential increases in absolute thinking, then relativistic thinking, and finally a simple form of dialectical thinking. Thus, passion about normative events preceded independent thoughtful consideration of those events.

The nature of the relation between affective expression and abstract thinking seems regular and pro-essive in Anne Frank’s diary. For Anne, a normative event or problem typically received a dense emotional description. When an issue was accompanied by dense emotional description, it was followed by progressively more advanced cognition. The appearance of each normative episode triggered the same sequence of adaptive responses and strategies.

Developmental change in affect-cognition was not simply event driven. Sometimes the same event occurred several times without emotional density. For example, when Anne began to notice Peter’s moods and her Own moods with respect to Peter, it was not because Peter suddenly appeared in her life. Previous notes On Peter vaguely referred to him in family gatherings, and of course he had been living in the annex with Anne from the beginning. It is the attachment of dense emotional expression to their relationship
that marks its entry as a developmental issue for cognitive construction. It is clear from the excerpts provided here that when a period of high emotional density is examined out of context, it does not reflect cognitive level in any regular fashion. Measurement within a single time period would not produce the relationship found in the long-term diary study. A temporal lag obscures the potential relations between emotion and cognition. Perhaps this lag has contributed erroneously to theories that affect and cognition are oppositional or disassociated processes. The regular relation between cognition and emotion suggests that new cognitive levels are related to the need to resolve an emotional crisis, supporting the Hallian hypothesis. Rises in passion do not usually eliminate the adaptive roles cognition and emotion suggests that new cognitive levels in any regular fashion. Measurement within a single time period would not produce the relationship found in the long-term diary study. A temporal lag obscures the potential relations between emotion and cognition. Perhaps this lag has contributed erroneously to theories that affect and cognition are oppositional or disassociated processes. The regular relation between cognition and emotion suggests that new cognitive levels are related to the need to resolve an emotional crisis, supporting the Hallian hypothesis. Rises in passion do not usually eliminate the adaptive roles cognition and emotion suggests that new cognitive levels in any regular fashion. Measurement within a single time period would not produce the relationship found in the long-term diary study. A temporal lag obscures the potential relations between emotion and cognition. Perhaps this lag has contributed erroneously to theories that affect and cognition are oppositional or disassociated processes.

Our findings based on Anne Frank’s diary highlight the adaptive roles cognition and emotion may play in development. Even though our conclusions must be advanced with caution, since they are based on a study of a single, unique individual, they nevertheless raise a number of important and interesting issues about the nature of cognition-affect relations. Apparently, being emotional about normative events is a constructive aspect of adolescent development and leads to cognitive restructuring.

References

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