THE RELATIONSHIP BETWEEN COGNITIVE AND MORAL DEVELOPMENT

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The Relationship Between Cognitive and Moral Development

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ABSTRACT

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The present study investigates cognitive development and the development of moral reasoning within the framework of cognitive-developmental theory. The theory implies that cognitive development is a necessary but not sufficient condition for moral development. In the light of the relevant theory and research, it was hypothesized that

1. Level of cognitive development is positively related to age.
2. Level of cognitive development is positively related to the level of education.
3. Level of moral development is positively related to age.
4. Level of moral development is positively related to the level of education.
5. Level of moral development is positively related to the level of cognitive development.

The hypotheses were tested with subjects from the Psychology Department of Istanbul University and from the Engineering Departments of Istanbul and Yildiz Technical Universities. Level of moral development was assessed by the Defining Issues Test (DIT) and level of cognitive development was assessed by Logical Reasoning Test (LRT). The results did not confirm the hypotheses except the second hypothesis. Although no hypothesis was developed about the effects of department and sex, post-hoc analyses revealed

that engineering students and males scored higher on the LRT and psychology students and females scored higher on the DIT.

OZET

Kognitif ve Ahlaki Gelisim Arasindaki Iliski

Sevim CESUR

Bu calisma, bilissel gelisimi ve bilissel gelisimsel teori cercevesinde ahlaki gelisimi incelemektedir. Teori, bilissel gelisimin ahlaki gelisim icin gerekli sart oldugunu fakat yeterli sart olmadigini isaret etmektedir. Teori ve arastirmalarin isiginda,

1- Bilissel gelisimin seviyesi yasla pozitif iliskilidir,

2- Bilissel gelisimin seviyesi egitimin seviyesiyle pozitif iliskilidir,

3- Ahlaki gelisimin seviyesi yasla pozitif iliskilidir,

4- Ahlaki gelisimin seviyesi egitimin seviyesiyle pozitif iliskilidir,

5- Ahlaki gelisimin seviyesi billissel gelisimin seviyesiyle pozitif iliskilidir, hipotezleri gelistirildi.

Hipotezler Istanbul Universitesi Psikoloji ve Istanbul ve Yildiz Universitesi Muhendislik Bolumlerinden ogrenciler kullanilarak sinandi. Ahlaki gelisimin seviyesi Degerlerin Belirlenmesi Testiyle (DBT) ve bilissel gelisimin seviyesi Mantikli Dusunme Testiyle (MDT) degerlendirildi. Ikinci hipotez haricindeki hipotezler desteklenmedi. Bolumun ve cinsiyetin etkilerine dair hipotez gelistirilmemis olmasina ragmen, analizler muhendislik ogrencilerinin ve erkeklerin MDT'de, psikoloji ogrencilerinin ve kizlarin DBT'de daha yuksek puanlar aldiklarinin gosterdi.

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INTRODUCTION

For centuries, the question "what is morality?" has drawn the interest of philosophers or even ordinary people because the answer to this question has been thought to provide a general insight into the social order of the life of mankind.

Morality is also a basic part of psychology, and psychologists have also attempted to answer questions regarding the nature of morality, whether it is acquired, and whether it is universal or varies through history and across cultures. Four basic theoretical approaches to these questions can be identified: biological theories, psychoanalytic theory, social learning theory, and cognitive-developmental theories. In the following pages, each of these approaches will be summarized with special emphasis on cognitive-developmental theories. The theoretical and empirical literature regarding the development of morality in the context of cognitive development will then be reviewed. The purpose of the study to be reported in this thesis is to examine the relationship between cognitive development, age, education, and level of moral development.

Biological Theories of Morality: Philosophers have questioned whether human beings are equipped with an innate sense of morality. As summarized in Durkin (1995), Rousseau believed in the innate purity of human beings and thought that it was only when society got to work on the individual that problems arise. In a related intellectual tradition, Chomsky believed in a native capacity of self-expression and liberty, and held that, if we could

organize society correctly, then people would be able to live in systems of mutual respect and tolerance (cited in Durkin, 1995). That is, according to nativists, morality is something that is present at birth and can be developed if society provides the appropriate conditions. On the other hand, another biological approach, sociobiology, suggests that moral reasoning serves only to mask self-interest; for example, responsible behaviors of parents serve to protect one's own genetic material. Behaviors appear and recur because they maximize inclusive fitness, and moral behavior is not different from other kinds of behaviors (Durkin, 1995).

Psychoanalytic Theory: The founder of psychoanalytic theory, Freud, conceived morality as the control of sexual and aggressive instincts by the superego. The superego consists of internalized moral values and prohibitions taken from parents early in life (Gielen, 1994). This internalization takes place through the mechanism of identification. The child incorporates an image of the same sex parent, and attempts to match his/her own behavior to that image. It is the inner parent with his/her values and moral judgments that serves as the core of the child's superego (Bee, 1995).

Social-learning Theory: This theory conceptualizes morality as a set of learned habits, attitudes, and values. What a person will learn depends upon the social environment and the reinforcement conditions that the environment provides (Gielen, 1994). Internalization of moral behavior results from

parents' positive reinforcement (whether purposeful or incidental) of socially sanctioned acts; punishment which serves to inhibit anti-social behaviors; and observation of what happens to others or taking them as models. The internalized standards then govern behavior (Durkin, 1995).

Cognitive-developmental Theories: Cognitive-developmental theorists Piaget and Kohlberg focus upon the development of universal stages of moral reasoning (Gielen, 1994). Since the focus of this study is on cognitive-developmental approach, the theories of Piaget and Kohlberg will be reviewed here in more detail.

Piaget's Theory of Moral Development: According to Piaget (1932), all morality consists of a system of rules. Believing this Piaget investigated the attitudes of children of different ages toward the origin, legitimacy, and alterability of the rules, based upon a game of marbles, and he posed questions about stories which included moral conflicts. Based on these investigations he described morality as developing through three stages: amoral, heterenomous and autonomous.

During middle childhood, the child becomes aware of rules. However, for the child, the source of rules is external: they are given by adults. For children at this stage, the wrong behavior is that which is punished, and their thinking is dominated by the objective aspects of an event (such as the damage done by the action), rather than the subjective, that is intentions of the person. This objectivism is called "moral realism."

Gradually, intentions of the person are taken into account. In the stage of autonomous morality, changes occur in children's perception of rigidity of rules, and children's input into the rule system becomes important. In summary, Piaget (1932) views moral development as the movement from moral realism to autonomy, and this becomes possible with the help of peer interaction, since as the child interacts with different peers, he or she becomes aware of different perspectives.

Kohlberg's Theory of Moral Development: Kohlberg (1981) summarizes the definitions of morality of some philosophers, some psychologists and his own as follows:

> "In defining the distinctively moral, some writers stress the concept of rule and respect for rules (Kant, Durkheim, Piaget). Others identify morality with a consideration of welfare consequences to others (Mill, Dewey). Still others identify morality with an idealized moral self (Bradley, Royce, Baldwin). Finally, some (Rawls and myself) identify morality with justice." (p. 40)

Inspired by Piaget, Kohlberg, using a detailed set of hypothetical moral dilemmas, developed a cognitive-developmental theory of moral reasoning. For 15 years, Kohlberg and his colleagues studied the same group of 75 boys, following their development at three year intervals from early adolescence through early adulthood. With his hypothetical moral dilemmas, Kohlberg probed the underlying thinking of his subjects with a series of questions. He

then developed a typology which contains three levels, with each level containing two stages (Modgil, 1974).

Kohlberg's moral stages are epistemologically analogous to Piaget's cognitive stages (White, 1975). Stages imply an invariant developmental sequence, and they define structured wholes, total ways of thinking. Each higher stage (a) has new logical features, (b) includes the logical features of lower stages and (c) addresses problems which were unrecognized or unresolved by lower stages (Modgil, 1974).

According to Kohlberg's (1981) cognitive-developmental theory of morality, morality is characterized as developing in six stages which are grouped in three major levels: preconventional level (Stages 1 and 2); conventional level (Stages 3 and 4); postconventional level (Stages 5 and 6). These levels can be summarized as follows: At the preconventional level, moral decisions are formulated on the basis of immediate consequences to the individual (punishments and rewards); reasoning at the conventional level emphasizes adhering to the rules or norms of behavior established by external groups; at the postconventional level, the individual develops an increasingly strong personal commitment to self-selected universal principles (Shweder et al., 1987).

At the postconventional level (Stages 5 and 6), a person has abstracted general principles of freedom, equality, and solidarity from more specific societal or interpersonal expectations, laws and norms. At Stage 5, moral reasoning reflects the prior-to-society perspective of the rational individual who is bound to society by an imagined social contract. The social contract rests on principles of trust, individual liberty, and equal treatment for all,

which should be the basis of societal and interpersonal arrangements and relationships. At Stage 6, a person takes the moral point of view that expresses an impartial attitude of respect for persons as ends in themselves (Gielen, 1991).

Kohlberg specifies Piaget's explanation of heteronomy and autonomy as an account of moral development, but he sees the process as more extended in developmental time and more cognitively complex than "internalization of external values", as Piaget puts it. Kohlberg found elements of Piaget's heteronomy in his stages 1-4, and elements of Piaget's autonomy in stages 2-6 (Modgil, 1974).

Prerequisites of moral development

A central assumption of the cognitive-developmental approach is structural parallelism; that is, there is a fundamental unity of development among various domains of thought (Walker & Richards, 1979). Kohlberg has hypothesized that both cognitive development and perspective-taking development are necessary but not sufficient conditions for the development of moral reasoning and he proposed that Piaget's cognitive stages are basic to Selman's perspective-taking stages, which in turn, are basic to his moral stages (Gielen, 1994). Selman (Hayes, 1994) studied the development of interpersonal understanding. In particular, his research focused on the ability to take the perspective of another person (social role-taking), and on the relation of this ability to theoretically parallel stages in the development of moral thought. He used a set of interpersonal dilemma stories followed by a

semi-structured interview. The resulting model consists of five stages. Walker (1980) summarizes these stages as 1) subjectivity, 2) self-reflection, 3) mutual perspectives, 4) social and conventional system, and 5) symbolic interaction (Walker, 1980).

Several correlational and cross-sectional studies have examined relationships among stages of cognitive development, perspective-taking, and moral development. Walker (1980) states that moderate correlations have been found among them.

In one study, Walker (1980) explored the relationship between role-taking ability and moral reasoning in 60 middle-class children. The results supported the hypothesis that the development of the ability to understand the reciprocal nature of interpersonal relations is a necessary but not sufficient condition for the development of conventional moral thought.

Kohlberg (1981) states that since moral reasoning is clearly reasoning, advanced moral reasoning depends upon advanced logical reasoning and there is also a parallelism between individual's logical stage and his or her moral stage. Let us turn now the question of the development of logical reasoning.

Piaget's Theory of Intellectual Development

Kohlberg was a cognitive-developmentalist like Piaget, but Piaget's emphasis was on intellectual development rather than moral development. In general, Piaget saw intellectual development as having four main stages: sensorimotor, preoperational, concrete, and formal operational. In the formal operational stage, which the present study focuses on, children become

capable of logical thinking with abstractions, that is, with the "possible" as well as the "actual situation" (Cage & Berliner, 1991).

Formal operational thinking involves an abstract, hypothetico-deductive approach to the understanding of environmental events. The formal operational person initially thinks of all the possibilities that might be present in a situation or event and then proceeds to test out these possibilities systematically and determine what combinations of variables are active in the actual situation (Mortorano, 1977).

In the longitudinal study of Kuhn et al. (1977), it was confirmed that early adolescence is a period of emergence and development of formal operations. However, Keating (cited in Bee, 1995) estimates that only about 50 to 60 percent of 18-to-20-year-olds in Western countries seem to use formal operations. There is research supporting Piaget's most recent suggestion that the final substage of formal thinking may not appear until late adolescence or early adulthood (Mortorano, 1977). That is, although in his early thinking it was hypothesized by Piaget that early adolescence is the time of emergence of formal operations, in subsequent years he suggested a later time for their acquisition.

Research showed that as the age increases, scores on the formal operations tasks increase (Douglas, & Wong, 1977) and as the grade increases, scores on the tasks increases (Martorano, 1977).

Measurement of formal operations

Research studying formal operations varies in the method used for assessment. Some studies use performance tasks adapted from Piaget and

Inhelder's book "The Growth of Logical Thinking From Childhood to Adolescence" (1958). The most frequently used tasks are floating bodies (Langford and George, 1975); pendulum (Cauble, 1976; Kuhn, Lanher, Kohlberg, & Haan, 1977; Martorano, 1977; Walker, 1980); rods (Cauble, 1976; Martorano, 1977); balance (Cauble, 1976; Martorano, 1977); correlations (Kuhn, Langer, Kohlberg, & Haan, 1977; Martorano, 1977); chemicals (Kuhn, Langer, Kohlberg, & Haan, 1977; Martorano, 1977; Walker, 1980).

Some research has attempted to synthesize Piagetian theory with methods derived from mental tests. Examples of tests based on this approach are A Piagetian Test of Cognitive Development (Tuddenham, 1971), the British Intelligence Scale (Lovell, 1971), and the Logical Reasoning Test by Burney (cited in Andac, 1984).

In their study, Kuhn, Langer, and Kohlberg (1977) found that all adolescents and adults using Stage 5 or 6 reasoning were capable of formal reasoning on the Inhelder and Piaget pendulum and correlation problems. On the other hand, many adolescents and adults capable of the latter show no Stage 5 or 6 moral reasoning. They concluded that a high level of cognitive development is necessary for the upper stages of moral development, but higher levels of cognitive ability do not automatically imply mature moral reasoning.

The results of Cauble's (1976) research investigating the relationships among formal operations, ego identity, and principled morality suggests that formal operations may be necessary for making principled judgments.

The studies mentioned above used correlational and cross-sectional approach which showed that moral and cognitive development are related. Another way of showing that cognitive development is a prerequisite for moral development is to use manipulation studies. Walker and Richards (1979) propose that if certain cognitive stages are necessary for corresponding moral stages, then intervention in moral reasoning development can only be effective for those who have the appropriate cognitive prerequisites. In their study, Walker and Richards found that moral stage 3 subjects who have attained "early basic formal operations" are more susceptible to attempts to stimulate moral development than subjects who have attained only "beginning formal operations."

It was shown by the research mentioned above that the attainment of reasoning at Piaget's stages of formal operations is a precondition for progress to moral judgment at Kohlberg's Types 5 and 6 (judgments formed on the basis of moral principles). Why is it necessary to have formal operational thinking in order to reason in a postconventional way? The answer to this question given by Kuhn et al. (cited in Langford & George, 1975) is that the ability to reason about rules of conduct, rather than just with them, and to consider moral principles from a hypothetical standpoint is based on the abilities of formal operations which makes it possible to think hypothetically about a nonreal world.

Matching of stages of Kohlberg and Piaget

If Kohlberg's view is correct, all children who have reached a particular stage of moral development should also have reached at least the

equivalent stages of role-taking and cognitive development. The following table shows an outline of the matching of the stages of two theorists, Piaget and Kohlberg (Walker & Richards, 1979, p. 97). The table is based on the tenets of two theories and on the results of research conducted about them.

Table 1.

Parallel stages in cognitive and moral development

Cognitive Stages		Moral Stages
(not specified)	----------	Stage 1(heteronomy)
Concrete operations	----------	Stage 2 (mutual exchange)
Beginning formal operations	----------	Stage 3 (expectations)
Early basic formal operations	----------	Stage 4(social system and conscience)
Consolidated basic formal operations	--	Stage 5 (social contract)
(not specified)	----------	Stage 6 (universal principles).

[The cognitive stage that corresponds to Kohlberg's Stage 6 was not specified. The reason may be that Stage 6 was dropped by Kohlberg because it was not an empirically identifiable form of moral reasoning (Shweder, 1985). It may also be that there is nothing beyond Formal Operational Stage in Piaget's Theory]

Measures of Moral Development

Kohlberg's moral dilemma interview methodology is a verbal production task which requires the person to generate arguments in response to some moral dilemmas.

Each of the moral dilemmas presented by Kohlberg first requires a choice between competing values and then stimulates judgment about related rules and institutions. Three issues involving six values are assessed: life and law; punishment and morality-conscience; contract and authority (Nisan & Kohlberg, 1982).

Kohlberg's measure of moral development, called the Moral Judgment Interview (MJI), is time consuming and the scoring procedure for the MJI has been criticized as subjective and complex (Froming & McColgan, 1979). Rest et al. (1974) point out that the test-retest reliability of MJI in several studies has been poor. Correlations of Kohlberg's measures with other sets of moral dilemmas that use a similar interview method and similar stage-scoring guides have been only moderate. Another limitation of Kohlberg's measure is that a subject is not given scores unless the subject clearly and meaningfully verbalizes the idea (Schaefli, Rest, & and Thoma) but as Nisbett and Wilson (cited in Shweder et al., 1985) have put it "people know more than they can tell", and also Piaget talks about a decalage between an action and its verbalization (Ginsburg & Opper, 1969).

These methodological problems of Kohlberg's measure have motivated the search for a different method of developmental assessment (Rest et al., 1974). John Gibbs was a member of Kohlberg's original research team. His Social Reflection Measure (SRM) contains two of Kohlberg's dilemmas, and focuses the subject's thinking on sociomoral norms associated with the dilemmas. The SRM facilitates the data collection process since the test can be group administered, although it does rely on individualized follow-up

questions. Correlations between Kohlberg's and Gibbs' measures range from r=.50 to .85 (Gielen & Lei, 1994). The term "sociomoral reflection" is introduced for several reasons. Sociomoral (rather than simply moral) indicates the Kohlbergian (and Piagetian) emphasis on social interaction for defining that which is morally right and good. Reflection indicates that the "judgment" studied is the thoughtful consideration of reasons for certain decisions and values (Gibbs, Widaman, Colby, 1982).

Another instrument, Lind's Moralisches-Urteil (MUT) has been frequently used in German-speaking countries. It is a preference test based upon two moral dilemmas and is available in an English translation (Gielen & Lei, 1994).

Another member of Kohlberg's original research team, J. Rest (Rest, 1986) and his colleagues developed an objective measure of moral development, called the "Defining Issues Test" (DIT) (Rest, 1986). The DIT is a multiple choice test derived from Kohlberg's general approach. The items are based on prior research of subjects' verbalizations in response to hypothetical moral dilemmas (Schlaefli & Thoma, 1985). The DIT is composed of 6 stories, with 12 issues for each of the stories. Some of the same dilemmas are used in both Kohlberg's Moral Judgment Interview and the DIT; and the same theoretical orientation underlies both instruments (Froming & McColgan, 1979). The stage characterizations in the DIT are derived from Kohlberg's stage descriptions (Rest, Davison & Robbins, 1978). The assumption is that persons at different points in development will define the issues in these moral problems differently. The issues statements were written to represent different stages of moral judgement. Therefore the way a

person rates and ranks the statements can be used to locate that person's level of development in the postulated developmental sequence (Schlaefli & Thoma, 1985).

Because it uses a multiple choice reporting format, the DIT avoids the potential problem of confounding moral reasoning with the ability to articulate one's thinking (Nichols & Day, 1982). The DIT has been shown to have a substantial advantage over the Moral Judgment Scale: it can be used by independent investigators to provide similar results (Martin, Shafto, & Vandeinse, 1977).

While answering the DIT, subjects simply rank and rate prepared statements. Answers cannot be probed, and the question of faking by astute or lucky subjects arises. In one study (McGeorge, 1975), brief instructions were given asking subjects to fake bad (that is, to judge in the lower stages) fake good (to judge in the higher stages), or to record their own views (standard). Subjects were unable to fake high. Although it is theoretically possible to fake good in the DIT because of its multiple choice format, this study shows that it is not easy to do.

Despite its objective scoring procedure (Rest, 1974), the DIT has also some limitations. The DIT is limited by its rather difficult verbal and literary format (Kay, 1982), so it is advised not to administer the DIT to subjects under the 11th grade (Rest, 1986).

In a review of cross-cultural studies on the development of moral judgment using the DIT, Moon (1986) concludes that the similarity of the findings among 20 cross-cultural studies is a good demonstration that the DIT has cross-cultural validity in detecting moral reasoning structure and their

development in cultures other than the USA. On the other hand, a problem related to the P score appears in studies using the DIT. Snarey's (1985) review of 45 studies conducted in various cultures showed that only 1 or 2% of all responses are pure postconventional. The P score is a score of principled (postconventional) reasoning. Thus using P Score may limit our ability to assess level of moral development properly. Another limitation is the contents of some stories. Three of the stories (Webster, Student Take-Over, and Nespaper) are quite culture specific in content.

Another test, the Moral Development Test, was constructed by Ma (1989) based on Kohlberg's and Rest's measures. It consists of five dilemmas, each one describing a hypothetical situation, and subjects are asked to imagine themselves in the situation. The hypothetical dilemma is followed by sets of questions divided into two parts. The test format of the MDT Part II was based on Rest's Defining Issues Test rating format.

Kohlberg's universality claim

Kohlberg's aim was to develop a universal theory of morality. Nisan and Kohlberg (1982) suggest that while the specific content of moral judgment may vary among cultures, the basic structures are universal. On the other hand, Snarey (1985) claims that the minimal requirement for the universality claim might be that research must be done in several non-Western and nonindustialized traditional cultural groups in addition to Western European countries, because Kohlberg is criticised for developing a theory of morality by using only American subjects and for being influenced by

Western philosophers only like Socrates, Kant, or Rawls (Snarey, 1985; Shweder, et al., 1985).

The cross-cultural studies which were done in non-Western countries can be basically divided into two categories: The first set of studies used Kohlberg's Moral Judgment Interview, for example, in Nepal (Heubner & Garrod, 1993), Bahamas (White, 1975; White, Bushnell, & Regnemer, 1978), Turkey (Turiel, Edwards & Kohlberg, 1978; Nisan & Kohlberg, 1982), Israel (Bar-yam, Kohlberg & Naame, 1980), Nigeria (Maqsud, 1979), and the Caribbean (Gorsuch & Barnes, 1973). The second group of studies used Rest's DIT, for example, in Korea (Park & Johnson, 1984), Hong Kong and China (Ma, 1988; Ma & Cheung, 1996; Hau & Lew, 1989) and Israel (Zeidner & Nevo, 1989). In a review of 20 cross-cultural studies of the DIT, Rest concludes that he found similarities between cultures much more impressive than the differences between them (cited in Ma & Cheung, 1996). These findings obtained from widely differing societies support certain assumptions underlying Kohlberg's claim to universality.

Two aspects of the claim of universality are that moral responses of individuals in any culture fit the structures suggested by Kohlberg (are classifiable in one of his stages) and that the stage sequence is constant across cultures (Nisan & Kohlberg, 1982). In a study by Turiel, Edwards and Kohlberg (1978) both longitudinal and cross-sectional data were obtained in 1964, 1966, and 1970 in Turkey. The study showed that moral judgments of Turkish subjects were consistent with the stage definitions and with the prescribed order of their attainment. In a second study by Nisan and

Kohlberg (1982), scorers had no difficulty and achieved satisfactory agreement analyzing the Turkish responses according to Kohlberg's stages, using a manual which requires matching of responses.

An assumption of universality is that stage development among individuals is found to be upwardly invariant in sequence and without significant regressions, regardless of cultural settings. Snarey's (1985) review of 45 studies done in various countries showed that stage sequence is invariant but there are some cases of regression although in small proportions.

Snarey's review also showed that postconventional reasoning is a rare empirical phenomenon and its distribution is skewed towards particular types of societies (Western) and classes (urban, middle). This review further revealed while all of Kohlberg's modes of moral reasoning were present in different parts of the world, all moral modes of different nations were not reflected in Kohlberg's scheme. In particular, he mentioned that collective or communalistic principled reasoning is missing or misunderstood. In the same line with this assumption, Zimba (1994) concluded after his research in Zambia that social identity can be part of the definition of a moral agent, and thus a collective sense of well-being should be added to Kohlberg's system. Heubner and Garrod (1993) mentioned that moral situations in India are not limited to relations between humans alone but are extended to other forms of life. These findings suggest that Kohlberg's morality theory may not be unquestioningly accepted as a universal theory, especially in relation to different modes of moral reasoning of different cultures.

Effects of age and education on moral development:

There are some variables that may influence the level of moral development. Cognitive developmental theory postulates a change over time from less advanced forms of thinking to more advanced forms of thinking (Moon, 1986), that is, age is one of the necessary conditions for cognitive development or moral development based on cognitive development. As Rest et al. (1978) note, the number of years in school and age are related to the way subjects judge moral issues as assessed by the DIT.

Rest (1975) found that age is an important variable in stage shifts; a whole stage shift occurs in these data on the average of once in 5.62 years. As age increases, the distribution of responses changes (that is, responses in higher stages increase and responses in lower stages decrease). In Kohlberg's original dissertation study age accounted for 60 percent of variability in the subjects' moral judgment scores (Gielen, 1994).

In their longitudinal study, Rest and Thoma (1985) examined the relationship between formal education and moral development using subjects who attended college, and subjects who had not. They found that the high education group showed increasing gains, and the low education group showed no gains across years. Years in college add significantly to the moral judgment score. In interpreting this gain in college, they assume that there is a general sociomoral perspective in college which emphasizes principled moral thinking; college encourages and stimulates intellectual activity and this stimulation also includes moral thinking (Langford & George, 1975). In a review of studies done in 20 countries, it was found that older and better educated subjects are likely to attribute more importance to higher stage issue

items (Moon, 1986). White (1975) and Martin, Shafto, and Vandeinse (1977) also found an age trend in moral judgment scores.

Hypotheses

In the light of theories and research that were mentioned above, the questions asking the relationships between cognitive development, age and education, and relationships between moral reasoning, cognitive development, age and education will be investigated. In the research, the DIT will be used as the instrument for assessing level of moral development. One of the aims of the study is to see if the DIT is an appropriate device to study moral development of Turkish subjects. So after the administration of the DIT, subjects will be asked how they felt about the DIT as an instrument, whether they found it easy to comprehend, to answer and the like. The following hypotheses related to the questions mentioned above were developed:

Hypotheses about cognitive development:

1. Level of cognitive development is positively related to age.
2. Level of cognitive development is positively related to the level of education.

Hypotheses about moral development:

3. Level of moral development is positively related age.
4. Level of moral development is positively related to the level of education.

Hypothesis about the relationship between cognitive and moral development:

5. Level of moral development is positively related to the level of cognitive development.

METHOD

Subjects

Since the emergence of formal operations is seen in early adolescence, and the difficult format of the DIT requires the use of subjects above 15-16 years (Rest, 1986), subjects were chosen from among university students. Students from the Psychology and the Engineering Departments of Istanbul University and Engineering Department of Yildiz Technical University served as subjects for the study. Students from Engineering Departments of Istanbul and Yildiz Technical Universities were combined and categorized as Engineering students during analyses. Subjects were tested with the permission of school administrations.

Since it was found that the average DIT score increases about 10 points with each increase in the level of education (i.e., undergraduate, graduate) (Rest, 1978), subjects were planned to be chosen from the first, second, third and fourth year of the Istanbul University and Yildiz Technical University to see the effect of years of education on formal and moral reasoning. But no subject from the first year of Yildiz Technical University could be reached.

The number of female students in the psychology department was greater than the number of female students in the engineering departments, and the number of male students in the engineering departments was greater than male students in the psychology department. So a greater number of female students came from the Psychology Department and a greater number of male students from the Engineering Departments.

120 students from Psychology Department and 52 students from Engineering Departments were tested but at the end of the "inconsistency checks" of the DIT protocols, 30 subjects from Psychology and 8 subjects from Engineering were eliminated, resulting in a subject loss of %25 in the psychology department and %15 in the engineering groups. And because there were no first-year students from engineering departments, first-year subjects from the psychology department were also eliminated in order to make the different departmental samples more comparable. Thus, the final sample consisted of 114 subjects.

Mean age of Psychology students was 21.20 (between 18 and 35) and of Engineering students was 21.11 (between 18 and 24).

The following table shows the distribution of subjects according to department, sex and class.

Table 2.

The Distribution of Subjects

	Psychology		Engineering		Total	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
2. Year:	**2**	**33**	**6**	**4**	**8**	**37**
3. Year:	**2**	**15**	**11**	**---**	**13**	**15**
4. Year:	**3**	**15**	**16**	**7**	**19**	**22**
TOTAL :	**7**	**63**	**33**	**11**	**40**	**74**

Materials

Measurement of morality: The Defining Issues Test (DIT) (Rest, 1986) was used to assess the levels of moral development. In the first part of the DIT, subjects read a moral dilemma; in the second part they are asked to make a decision about the dilemma. In the third part, they are presented with 12 issues about the dilemma and they are asked to evaluate the issues by rating each issue on a Likert scale of importance ("most", "much", "some", "little", "no") in deciding what ought to be done. In the fourth part, subjects rank their four choices of the most important issues (Rest, Cooper, Coder, Masanz & Anderson, 1974).

The DIT contains three political and three moral dilemmas some of which are taken from the Moral Judgment Interview of Kohlberg (Gielen & Lei, 1991). The name and the themes of the stories are listed below (Martin, Shafto & Vandeinse, 1977) .

1. Heinz and the Drug: Property rights vs. value of human life
2. Student Take-Over: Civil disobedience vs. legal authority
3. Escaped Prisoner: Letter of the law vs. purpose of the law
4. Doctor's Dilemma: Euthanasia issue
5. Newspaper: Freedom of expression vs. established authority
6. Webster: Equal opportunities vs. proprietary rights (p. 461).

Rest (1986) states that short versions of the DIT may also be used. In these short versions any three or four of the stories may be selected. Since two of the stories of the DIT ("The Student Take-Over" and "The Newspaper") are quite culture-specific and may not be easily appreciated or understood by subjects in other cultures, these two stories were eliminated.

The DIT is objectively scored and provides scores for moral stages 2, 3, 4, 5(A), 5(B), and 6. No items for Stage 1 are included in the DIT. Preferences for principled thinking (Stages 5A, 5B, and 6, combined) are expressed by the P%-Score (P score); the P Score indicates the percentage of a person's rankings that fall in the principled range (Gielen & Lei, 1991). The test-retest reliabilities of the P score are in the high .70s and low .80s (Rest, Davison & Robbins, 1978).

The DIT can be administered by untrained personnel to large numbers of subjects in 30 minutes (Froming & McColgan, 1979).

The final form of the test can be seen in Appendix I.

Measurement of formal operations: The Logical Reasoning Test was used to assess the level of cognitive development. This test was designed to assess Piaget's formal stage of development by Burney (Ardac, 1984) and was adapted into Turkish by Ardac who studied the relationship between science achievement and logical reasoning ability, and named it "Mantikli Dusunme Testi" (MDT). This test is an objective, group-administered, paper-pencil test. The test has 21 questions, 12 of them on scientific reasoning and 9 on verbal reasoning.

The Kuder-Richardson reliability coefficient for the MDT was 0.70 (Ardac, 1984) (The MDT is reproduced in Appendix II).

Pilot studies

Three pilot studies were done before collecting data for the main study. In the first pilot study, the DIT was administered to 9 university students. In this pilot study, some of the subjects reported discomfort with the DIT; 3 of the 9 subjects mentioned that the information in the stories was insufficient to make a decision; 7 of the 9 subjects reported that the 12 issues of the DIT were not sufficient to show the underlying reasoning of their judgment, and some of them identified different considerations from those in the DIT.

Because of the reactions of the subjects to the stories and the issues, it was decided to carry out a second pilot study. The aim of the second study was to collect the free judgments of subjects without leading them by using the issues. So the four stories were given to subjects without the 12 issues for each story and they were asked to state their underlying reasoning while judging the dilemmas. A heterogeneous sample was chosen to examine values and to support the generalization of any conclusions drawn from the results. The sample was composed of 93 subjects (41 female and 52 male); the age range was between 10 and 67. Subjects varied on education level and occupation. The content analysis showed that subjects tended to use some considerations other than those which DIT provides.

The themes which could be classified as one of the issues of the DIT were labelled as Category A and the themes which could not be classified as one of the issues were labelled as Category B. The Mann-Whitney U Test showed that the number of Category B responses was significantly higher than the number of Category A responses. As a further examination, Category B responses were also divided into four groups: 1. Suggested actions other than

the two choices(f=126) (for example, in Heinz and the Drug (Hasan ve Ilac): "He should try to find money by requesting the help of public services"); 2. Requiring more information about the details of the situation(f=45) (for example, in Escaped Prisoner (Kacak Mahkum): "Which crime Mahmut Bey is committed is very important in making a judgment"); 3. Possible outcomes of the actions (f=59) (In Hasan ve Ilac: "If he was caught after the theft, he would not be with his wife whenever she needed him"); and 4. Some other considerations (f=201). Some subjects were interested in what the other character of the story should do instead of the main character's choice. For example, in Escaped Prisoner (Kacak Mahkum): "Mahmut Bey should denounce himself, in this way he can relieve his pangs of conscience", in Doctor's Dilemma (Doktorun Ikilemi): "The woman should not force the doctor to make this kind of a decision". A discussion of this second pilot study is included in the discussion part.

As a third pilot study, both the DIT and the MDT were administered to 10 subjects between 18 and 25 years of age living in Samsun or Istanbul. The aim of the third pilot study was to see how long it takes to administer these two tests. Some of the subjects were high school graduates and some university students. The average score for the DIT was 36 out of 95 and the average score for the MDT was 13.5 out of 21. Subjects easily understood the tests and did what was expected from them. The average time needed to answer the DIT was 27.1 minutes and 19.6 minutes for the MDT.

Questions concerning demographic variables (age, sex, school, class) were asked on the first pages of both tests.

Procedure

Some groups of subjects were tested in their rooms with the permission of their teachers. Some groups of subjects were taken into empty rooms and tested. And some students took the tests to their homes, answered and brought them back. This was done because of the time pressure (the week during which the administrations took place was the last week of the schools and some educators did not allow to administer the tests in their lecture time).

First, subjects were asked to answer the cognitive tasks. Then, they were told that they would read some social problems and that they were expected to make judgments about these problems.

In group administrations, the average time for answering the MDT was 20 minutes and for the DIT 25 minutes.

RESULTS

A score for formal operations derived from the MDT was used as the measure of cognitive development and the P score from the DIT was used as the measure of level of moral development.

Cronbach's Alpha was computed for the 21 items of the MDT; the reliability coefficient was .71. A weak but significant positive correlation was found between the scientific reasoning items and verbal reasoning items of the MDT ($r = .29$, $p < .001$).

The relationship between formal operations score and age

As a test of Hypothesis 1, predicting a positive relationship between formal operations and age, the Pearson Correlation Coefficient was calculated to discover the relationship between age and formal operations. Table 3 shows the means and standard deviations of formal operations scores as a function of age. It was found that there was no significant correlation between formal operations scores and age of subjects ($r = .15$, $p > .05$).

Table 3. Means and Standard Deviations of Formal Operations Score as a Function of Age.

	Formal Operations Score	
Age	Mean	SD
18	15.2	1.92
19	15.6	3.48
20	16.0	2.86
21	17.1	2.30
22	16.2	3.91
23	16.7	2.71
24	16.7	16.7
25	18.0	.0
26	18.0	.0
28	21.0	.0
35	16.0	.0

Relationship between formal operations score and education

Means and standard deviations of formal operations score were computed as a function of grade in school and these are presented in Table 4.

Table 4.

Means and Standard Deviations of Formal Operations Score as a Function of Grade

	Formal Operations Score		
	Mean	SD	n
2. Year	15.3	2.69	45
3. Year	16.7	3.11	28
4. Year	17.1	3.06	41

To test Hypothesis 2, that formal operations score is positively related to level of education, one-way analysis of variance was applied to formal operations scores for three classes. Analysis of variance yielded a significant F value [$F(2,111)=4.53$, $p=.01$]. A summary of the analysis is shown in Table 5. Tukey's HSD test revealed that formal operations scores of 4th grade students were significantly higher than those of 2nd grade students ($p<.05$).

Table 5.

Analysis of Variance of Formal Operations Score by Grade

Source	SS	df	MS	F	p
Total	1008.99	113			
Grade	76.16	2	38.08	4.53	<.05 *
Error	932.84	111	8.40		

* Significant at the .05 level

The relationship between P Score and age

Table 6 shows the means and standard deviations of P scores as a function of age. To test Hypothesis 3, predicting a positive relationship between P score and age, Pearson Correlation Coefficient was calculated. P scores did not correlate significantly with age of subjects ($r=.06$, $p>.05$).

Table 6.

Means and Standard Deviations of P Score as a Function of Age

Age	Mean P Score	SD
18	35.0	16.68
19	35.1	12.17
20	33.5	16.01
21	28.0	9.49
22	34.0	13.19
23	31.8	15.31
24	33.7	4.33
25	52.5	.0
26	17.5	.0
28	42.5	.0
35	52.5	.0

The relationship between P score and education

Means and standard deviations of P scores were computed as a function of grade and these are presented in Table 7.

Table 7.

Means and Standard Deviations of P Score as a Function of Grade

	P Score		
	Mean	SD	n
2. Year	35.8	13.42	45
3. Year	30.5	16.46	28
4. Year	31.8	11.19	41

To test Hypothesis 3, predicting a positive relationship between moral development and level of education, one-way analysis of variance was applied to P scores for the three classes. Analysis of variance did not yield a significant variability for P score as a function of grade [F(2,111)=1.57, p=.21]. A summary of the analysis of variance is shown in Table 8.

Table 8.

Analysis of Variance of P score by grade

Source	SS	df	MS	F	p
Total	20825.44	113			
Grade	572.89	2	286.45	1.57	>.05
Error		20252.55	111		182.46

The relationship formal operations score and P score

The Pearson Correlation Coefficient test was carried out to test Hypothesis 5, that P score is positively related to formal operations score. The correlation was not significant (r=.00, p>.05).

Subjects who have P scores under 25% of scores and above 75% of scores were chosen and a t-test was applied to formal operations sores of two groups. This did not yield a significant difference between groups [t(620=-.78, p=.44].

Post-Hoc Analyses:

The Effect of Department on P Score

A stepwise multiple regression analysis using P scores as the criterion variable, with formal operations score, age, class, and department (although

no hypothesis was advanced about the effect of department) entered in that order, showed that department accounted for 12% of the variance in P scores [F(1,112)=15.64, p=.001]. The other variables did not contribute significantly to the variability in P scores (See Table 9).

Table 9.

Stepwise Regression Analysis Using Formal Operations Score, Age, Grade, and Department as Predictors and P Score as the Dependent Variable

Predictor	Beta Weights	Adjusted R^2	F
Formal O. Score	.09	-	1.05
Age	.06	-	.71
Grade	-.03	-	-.28
Depart	-.35	-.11	15.64 *

* p<.001

The differences between the two departments on P scores were analyzed by t-test. Means and standard deviations of P scores as a function of department are presented in Table 10. Psychology students had significantly higher P scores than the engineering students [t(112)=3.96, p=.00)

Table 10.

Means and Standard Deviations of P Score as a Function of Department

	Mean P Score	SD	n
Psychology Students	36.9	13.61	70
Engineering Students	27.1	11.31	44

Effect of department on formal operations score

Means and standard deviations of formal operations scores of subjects were computed as a function of department (See Table 11). Engineering students had significantly higher formal operations score than the psychology students [t(112)= -2.83, p=.01].

Table 11.

Means and Standard Deviations of Formal Operations Score as a Function of Department

	Formal Operations Score		
	Mean	SD	n
Psychology Students	15.7	2.91	70
Engineering Students	17.3	2.87	44

Self-selection effect on formal operations score

In order to see whether the differences between departments on formal operations scores were caused by a self-selection effect (that is, whether the differences were caused by the characteristics of students which led them to choose one of the two departments while entering the university exams), t-tests were carried out for 2nd, 3rd, and 4th classes of the two departments separately. In the 2nd, 3rd and 4th classes, departments did not vary significantly on formal operations score [t(43)=-.23, p=.82; t(26)=-1.55, p=.13; t(39)=-1.64, p=.11, respectively], although the scores of

engineering students were higher than those of the psychology students in general (See Table 12 for means and standard deviations of formal operations scores in three classes of departments)

Table 12.

Means and Standard Deviations of Formal Operations Scores in Three Classes of Departments

	Formal Operations Score					
	Psychology			Engineering		
	Mean	SD	n	Mean	SD	n
2. Year	15.3	2.69	35	15.5	2.37	10
3. Year	16.0	2.57	17	17.8	3.66	11
4. Year	16.3	3.61	18	17.8	2.42	23

Self-selection effect on P score

When the dependent variable was P score, in the 2nd grade, the departments did not vary significantly [t(43)=1.22, p=.23]; however, psychology students had higher P scores than engineering students (m=37.1, m=31.3, respectively). In the 3rd grade, psychology students had significantly higher P scores than engineering students [t(26)=3.43, p=.00] (m=37.8, m=19.3, respectively). In the 4th class, the difference was not significant [t(39)=1.87, p=.07], although psychology students had higher P scores than engineering students (See Table 13 for means and standard deviations of P scores in three classes of departments)

Table 13.

Means and Standard Deviations of P Scores in Three Classes of Departments

	P Score					
	Psychology			Engineering		
	Mean	SD	n	Mean	SD	n
2. Year	37.1	13.37	35	31.3	13.24	10
3. Year	37.8	14.52	17	19.3	12.90	11
4. Year	35.4	13.86	18	29.0	7.79	23

Effects of department and sex on formal operations score

Although no hypothesis was advanced regarding the relation of department and sex with formal operations, an analysis of variance was carried out to see the effects. Means and standard deviations of formal operations score were computed as a function of department and sex (See Table 14).

Table 14.

Means and Standard Deviations of Formal Operations Score as a Function of Department and Sex

	Formal Operations Score					
	Psychology			Engineering		
	Mean	SD	n	Mean	SD	n
Males	18.2	2.43	7	17.6	2.83	33
Females	15.4	2.84	63	16.5	3.01	11

Factorial analysis of variance was applied to formal operations scores with sex and department as independent variables. There was a main effect of sex [$F(1,110)=5.91$, $p=.02$], with males having significantly higher formal

operations scores than females (m=17.7; m=15.6, respectively). There was no main effect of department [F(1,110)=.32, p=.58], although engineering students had higher scores than psychology students. There was no interaction effect of department and sex [F(1,110)=1.54, p=22). A summary of the analysis of variance is shown in Table 15.

Table 15.

Analysis of Variance of Formal Operations Score by Department and Sex

Source	SS	df	MS	F	p
Total	1008.99	113			
Department (D)	2.53	1	2.53	.32	>.05
Sex(S)	47.36	1	47.36	5.91	<.05 *
D*S	12.32	1	12.32	1.54	>.05
Error	681.77	110	8.02		

* Significant at the .05 level

Although factorial analysis of variance did not yield a significant main effect of department on formal operations score, t-test revealed that engineering students had higher formal operations score than psychology students [t(-2.83)=112, p=.005] (mean=17.30; mean=15.71, respectively).

Effect of Department and Sex on P Score

Means and standard deviations of P score were computed as a function of department and sex (See Table 16).

Table 16.

Means and Standard Deviations of P Score as a Function of Department and Sex

	P Score					
	Psychology			Engineering		
	Mean	SD	n	Mean	SD	n
Male	35.0	13.99	7	25.9	10.97	33
Female	37.0	13.66	63	30.7	12.09	11

A two-way analysis of variance with department and sex as the independent variables was carried out on the P Scores. There was a main effect of department [F(1,110)=5.04, p=.03]: psychology students had significantly higher P Scores than engineering students (m=36.1, m=27.5, respectively). There was no main effect of sex on P Scores [F(1,110)=1.14, p=.29]. There was no interaction effect of department and sex on P Score [F(1,110)=.16, p=.69). See Table 17 for a summary of the analysis of variance.

Table 17.

Analysis of Variance of P Score by Department, and Sex

Source	SS	df	MS	F	p
Total	20825.44	113			
Department(D)	826.94	1	826.94	5.04	<.05 *
Sex(S)	186.74	1	186.74	1.14	>.05
D*S	2765.86	1	26.99	.16	>.05
Error	18059.58	110			

* Significant at the .05 level

Although factorial analysis of variance did not yield a significant main effect of sex on P scores, one-way analysis of variance revealed a significance difference in P scores as a function of sex [$F(1,112)=11.32$, $p<.001$]; females had significantly higher P scores than males (mean=36.08; mean=27.5, respectively) (See Table 18 for a summary of analysis of variance).

Table 18.

Analysis of Variance of P scores by Sex

Source	SS	df	MS	F	p
Total	20825.44	113			
Sex	1911.93	1	1911.93	11.132	.001
Error	18913.51	112	168.87		

Percentages of Moral Stage Scores

Table 19 shows means and standard deviations of percentage of moral stage scores. The raw stage scores are converted to percentages by dividing the raw scores by .4. As illustrated by the table, Stage 4 scores are the highest for both psychology and engineering students, while Stage 3 is the second highest stage for both departments. The table also includes the DIT indices of college students from the standardization sample in the USA (Rest, 1986). The college group consisted of subjects who had some college education but had not yet graduated similar to the subjects of the present research. But the departmental majors of college students were not mentioned by Rest. The table shows that for the American sample, too, Stage 4 has the highest scores but then, contrary to Turkish subjects, Stage 5a

reasoning is the second highest. And the overall P scores of American sample are higher than those of Turkish subjects.

Table 19.

Means and Standard Deviations of Percentages of Morality Stage Scores

	Psychology		Engineering		Total		USA Sample	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Stage 2	7.4	6.08	7.0	5.69	7.3	5.91	5.9	2.81
Stage 3	22.7	10.62	20.0	10.31	21.7	10.54	14.3	5.14
Stage 4	24.8	14.52	34.7	11.97	28.6	14.38	28.4	8.7
Stage 5a	22.5	11.62	17.0	8.34	20.4	10.77	26.4	6.31
Stage 5b	5.8	5.20	3.2	4.71	4.8	5.15	8.7	3.40
Stage 6	8.6	6.75	6.9	6.45	7.9	6.66	8.2	3.34
Stage A *	4.6	7.83	6.8	8.51	5.5	8.13	4.2	2.61
P Score	36.8	13.61	27.1	11.31	33.1	13.58	43.1	14.32

* An antiestablishment orientation which condemns tradition and existing social order

An index of conventional reasoning

P Score is calculated by adding Stage 5 and Stage 6 scores so that it is an index of only principled moral reasoning. On the other hand, another index, the D index, reflects all stage scores but its calculation is rather

complicated and needs a special computer program (Schaefli, Rest, & Thoma, 1985), and thus P Score is preferred by most researchers, and is used in the present study for morality scores. At the same time, because as seen in Table 18, Stage 3 and 4 scores of subjects were higher than postconventional stage scores of those subjects, a new index of conventional reasoning, the C Score, was calculated. The C Score was calculated by simply adding the percentages of Stage 3 and Stage 4 scores, the same procedure used in calculating the P Score. Table 20 shows the means and standard deviations of percentages of the C and P scores.

Table 20.

Means and Standard Deviations of Percentages of C and P Scores

	Psychology		Engineering		Total	
	Mean	SD	Mean	SD	Mean	SD
C Score	47.5	14.77	54.7	11.30	50.3	13.94
P Score	36.9	13.61	27.1	11.31	33.1	13.58

The differences between the C scores for the two departments were analyzed by t-test. Engineering students had significantly higher C scores than the Psychology students [$t(112)=-2.77$, $p<.01$]. The two departments were combined and mean P scores and mean C scores were compared by a t-test. It was found that C scores were significantly higher than P scores of students [$t(113)=7.17$, $p=.00$], that is, subjects use conventional kind of reasoning more than principled moral reasoning.

Distribution of subjects into cognitive stages

It was mentioned by Andac (1985) that subjects who had scores under 9 for the MDT could be regarded as being in the stage of "Concrete Operations", while subjects who had scores between 8 and 14 could be regarded as being in the "Transitional Stage" between the Concrete Operational and the Formal Operational Stages, and subjects who had scores above 15 could be regarded as being in the "Formal Operational Stage". Since in the present research there is only one subject who had a score under 9, this subject was also included into the Transitional Stage. Means and standard deviations of Transitional and Formal Operational Stage scores were calculated. These are presented in Table 21.

Table 21.

Means and Standard Deviations of Transitional and Formal Operational Stage Scores

	Transitional Stage			Formal Operational Stage		
	Mean	SD	n	Mean	SD	n
Psychology						
	12.4	2.13	22	17.3	1.67	48
Engineering						
	11.8	1.72	6	8.2	1.90	38
Total						
	12.3	2.03	28	17.7	1.82	86

When the percentages of the stages were calculated from the table, it can be seen that 45% of psychology students are in the Transitional Stage

(mean age= 20.5), and the remainder in the Formal Operational Stage (mean age= 21.4). On the other hand, 15% of engineering students are in the Transitional Stage (mean age= 21.3) and the remainder in the Formal Operational Stage (mean age= 21.1). When the two departments are combined, %32 of the students are in the Transitional Stage (mean age= 20.7) and the rest are in the Formal Operational Stage (mean age= 21.2).

P Scores as a function of cognitive stages

Means and standard deviations of C and P scores were computed as a function of cognitive stages (that is, transitional and formal operational stages), and these are presented in Table 22.

Table 22.

Means and Standard Deviations of C and P Scores as a Function of Cognitive Stages

	Transitional Stage		Formal O. Stage	
	C Score	P Score	C Score	P Score
Psychology	45.2	36.7	48.0	36.8
Engineering	56.5	27.0	54.5	27.1
Total	48.3	34.0	50.7	32.9

One-way analysis of variance was applied to C and P Scores for two stages of formal operations. Analysis of variance did not yield significant differences in C and P scores as a function of cognitive stage [F(1,113)=.31,

p=.58; F(1,113)=.07, p=.79, respectively]. (See Table 23 and 24, respectively, for summaries of the analysis of variance).

Table 23.

Analysis of Variance of C Scores by Cognitive Stage

Source	SS		df		
	MS		F		p
Total	21946.98	113			
Cognitive Stage	59.60	1		195.42	
	.31		>.05		
Error	21887.38	112			1995.42

Table 24.

Analysis of Variance of P Score by Cognitive Stage

Source	SS	df	MS	F	p
Total	20825.44	113			
Cognitive Stage	12.94	1	12.94	.07	p>.05
Error	20812.49	112	185.83		

DISCUSSION

The findings did not support the hypothesis that level of cognitive development is positively related to age. The hypothesis that level of cognitive development is positively related to years of education was partially supported. The hypotheses that the level of moral development is positively related to age and level of education; and that there is a positive relationship between level of cognitive development and moral development were not supported.

Relationships between cognitive development, age and education

No correlation was found between age and formal operations score. Stage theories naturally require age for development to a new stage. But age and education are usually confounded variables, especially in studies with students, since educationally more advanced students are almost invariably older. Age is not a major contributor to formal operations scores in the present study. But if it has been found to be a major contributor in most of the studies in the literature, then why did it not appear in this study? A very likely explanation is the limited age range of the subjects. The age range was between 18 and 35 in the present study but the number of students older than 24 was only 4. For further research, a wider age range including the lower age levels can be used to see the effect of age. In this kind of study, children, adolescents, and adults could be used as subjects.

One-way analysis of variance showed a grade effect on formal operations score, with the 4th grade having higher scores than the 2nd grade. This finding is in line with the expectations of cognitive stage theory. As the child learns more, he/she reorganizes his/her structures and progresses to more developed levels.

Relationships between moral development, age and education

Age did not correlate significantly with P scores. The same limitations and comments made about the relationship between formal operations scores and age are appropriate for P scores and age, also. While reviewing Hau's and Watson's studies, Moon (1986) concludes that most of the contribution of age, education to DIT scores is due to education, and not to age. Whereas a one-stage movement in Kohlberg's 1958 scoring system took on the average 3 to 4 years to accomplish, a one-stage movement in his most recent scoring system averages over 10 years (Shaefli, Rest, & Thoma, 1985). So using a wider age range can provide some information about this relationship.

No class effect on morality score was found. If subjects who just graduated from high school, and subjects who graduated from university were compared, the effect of education could possibly have been seen. Rest (1986) stated that every level of education (for example, university and postgraduate education) adds 10 points to the morality score. On the other hand, comparison of the first year psychology students (who were excluded from the main sample) with fourth year psychology students did not yield a significant difference. Of course, by the end of the first year in university,

these students may be assumed to have been affected by their university education and perhaps to be different from new high school graduates.

Relationship between cognitive and moral development

The correlation between formal operations scores and P scores was not significant. Subjects with high and low P scores did not vary significantly on their formal operations scores.

The approach of the present study, that is seeking a relationship between the two domains by a correlational methodology may not have been an appropriate approach. According to Walker (1980), manipulative or longitudinal studies are appropriate for determining the nature of relationships, since with such methodology change in one domain can be examined as a function of development in other domains. Another approach, that is the typological approach, could be used instead. In this approach it may be argued that attainment of reasoning at Piaget's stage of formal operations is a precondition for progress to moral judgment at Kohlberg's Types 5 and 6, so that subjects who are in Kohlberg's Stage 5 or Stage 6 must be in Piaget's Formal Operational Stage. However, the DIT makes this approach difficult, since the DIT does not classify subjects into one of Kohlberg's stages, but rather it gives a general score in a continuum of morality scores, with Stage 5 or 6 responses being expressed as a percentage of total responses.

Another possible answer to the question of why a relationship was not found between formal operations and P score in this study, is the possible time lag between different domains. Walker (1980) states that a low correlation

would not necessarily indicate a lack of relationship between developmental variables. Structural parallelism implies that isomorphic processes are involved in parallel stages; but there are lags in development across domains, which may be due to the differing degrees of complexity which each involves. However, this assumption can not explain why psychology students and females had higher P scores although they had lower formal operations scores than engineering students and males. Here the distinctness of the two domains comes to mind. A possible explanation comes from the studies of Kuhn, Langer, and Kohlberg.

In a study by Kuhn, Langer, and Kohlberg (1977), although most subjects had developed the prerequisites of at least some formal operational thought, less than one quarter showed any of principled moral reasoning. The authors summarize two theoretical possibilities about the dynamic interrelations among different developmental domains (here the different domains are cognitive and moral development): Identity and independence.

Identity would imply that there is only one set of mental operations that undergoes reorganization, and these operations are applied in different content domains.

Independence would imply that, although development in the two domains may take place via common mechanisms (e.g., equilibration), development in each domain occurs independently, such that an attainment in one domain has no implications for attainments in the other. They further suggest that moral development may depend on a somewhat different set of organism-environment interactions than does logical development.

The findings of the present study appear to support Kuhn et al.'s second hypothesis. Also experimental studies show that an ethics educational intervention increases DIT scores but not logic scores, and a logic educational intervention increases logic scores but not DIT scores, thus arguing for the distinctness of moral judgment (Schaefli, Rest, & Thoma, 1985). Rest, Davison, and Robbins (1978) state that moral judgment is a distinct area of cognitive development that is not reducible to verbal IQ, Piagetian formal operations, or logical development in general.

Effect of department on moral and cognitive development:

A stepwise multiple regression analysis revealed department as the only variable that related to P the score. Further analyses comparing departments on formal operations score and P score indicated that engineering students had higher formal operations scores than psychology students and psychology students had higher P scores than engineering students. Walker and Richards (1979) mention that instruction in academic science courses might influence performance on some cognitive tasks. The two groups of the study differ in terms of the amount of science training they have received. This training and a possible effect of self-selection into departments may explain why engineering students had higher formal operations scores and why psychology students were high on P scores. Here another determinant of moral scores other than the level of formal operations comes to mind. This possible determinant is perspective-taking or role-taking ability. Selman suggested that role-taking ability may mediate between logical and moral reasoning. Moral reasoning involves making judgments affecting other

people, so that taking another's perspective would be important (cited in Walker, & Richards, 1979).

Damon showed that, consistent with expectations derived from Kohlberg's position, the correlation between spatial perspective-taking and justice reasoning was significantly higher than the correlation between justice reasoning and the logico-mathematical tasks (cited in Krebs, & Gillmore, 1982).

Krebs and Gillmore (1982) conclude that stages of role-taking and moral development should be more closely ordered than stages of moral development and cognitive development because the subject matter of role-taking and moral development is social in nature, but this is not the case for the logico-mathematical domain. It seems that perspective-taking ability is as important or more important for advanced moral reasoning than having formal operations. Since psychology students may be exposed to experiences which develop their perspective-taking ability, this may lead to their higher P scores on the DIT.

Rest (1986) indicates that the patterning of the academic major variable with DIT scores is not clear. He refers to the Gallia study, in which college major seems to make a difference. Although after reviewing some research Schaefli, Rest and Thoma (1985) conclude that academic courses in the humanities and social studies do not seem to have an impact on moral judgment development, and that students in the humanities show about the same amount of gain in DIT scores as students in the sciences, arguments which may explain the higher moral scores of psychology students found in the present study have received some support in the literature:

a) After finding that college education fosters moral development, Rest and Thoma (1985) concluded that in college there is a general socio-moral perspective, a general way of orienting to moral issues that emphasizes principled moral thinking. This conclusion applied to college in the US, which emphasizes a liberal arts curriculum even for students in technical programs. This type of curriculum is not required in engineering faculties in Turkey, and so it may be surmised that Rest and Thoma's argument may apply to psychology but not engineering students.

b) Along the same lines, Basseches (cited in Gibson, 1990) hypothesized that a systematic relationship may exist between working conditions and the extent to which jobs both demand and stimulate cognitive-structural development. Work roles both demand and promote increasingly powerful and decreasingly egocentric forms of social perspective-taking. The work roles that Basseches mentions may be similar in some ways to student roles in psychology departments. That is, a psychologist needs to have less egocentric forms of social perspective-taking and psychology departments no doubt try to train students in perspective-taking skills, because one of the aims of psychology is to understand the reasons for human behaviors.

c) Hoffman (1993) asserts that moral motives come from empathy, and he claims further that children have empathic capabilities, and that if their early socialization enhances these capabilities, the various empathic affects may become part of their affective and motivational structures. Just as they train for perspective taking, so psychology departments may also provide training which enhances empathic capacity. This, then brings us to moral capacity,

because according to Hoffman, moral motives come from empathic feelings. Hoffman claims that empathic affects do not require a victim to be physically present; because of human representational capacity what is required is that a victim or a potential victim be imagined. This imagination may occur through talking, reading or an argument about moral issues, or making moral judgments about other people's behavior in hypothetical situations. That is, students who read the moral dilemmas of the DIT may have empathic feelings, evoking their moral motives which then influence their decisions. This may be true for both psychology and engineering students; however, Hoffman (1993) argues that empathy may be developed through education, and it is probable that psychology departments provide more of this kind of education than engineering departments.

d) Another possible explanation is that psychology students may be more familiar with Kohlberg's theory than engineering students. Being exposed to the theory may affect the reasoning of students. Schaefli, Rest, and Thoma (1985) proposes that this exposure may have effects in two ways: **1)** A subject may learn how to perform on a test by learning the theory, that is, social desirability is a question here. However, the study of McGeorge (1975) showed that, although subjects were asked to fake good in the DIT, they were not able to do it. So social desirability alone probably does not cause higher scores of morality in the DIT. **2)** Exposure to the theory may change a person's thinking by facilitating the restructuring of thinking. However, it is unlikely the exposure that the psychology students get in undergraduate education of psychology department causes a change in students' thinking,

because they do not learn the theory with details, but only a summary of the theory. A study which compares psychology students who know Kohlberg's theory and those who do not know it may provide more precise information about the effect of the exposure.

e) A self-selection effect may be responsible for the high scores of engineering students on formal operations and the high scores of psychology students on morality. Rest and Thoma (1985) note for example that the gains of college students may be due to special characteristics of the people who choose to attend college. The same explanation may be appropriate for the students who choose different departments to study. Students in Turkey choose one of the branches (science or social science) in the second year of high school, and begin to prepare for the university entrance exams during last two years. The question is whether engineering students were high on formal operations and whether psychology students were high in morality reasoning before they began their studies at the university, or whether their departments caused the gains, or whether both explanations are correct. When 2nd, 3rd, 4th grades of both departments were compared on formal operations and P scores, it was found that although not significant, engineering students had higher formal operations scores in all three grades and psychology students had higher P scores in all three grades (significant only in the 3rd grade). However, this finding does not answer the question of whether the self-selection or education is responsible for the gain. A longitudinal study which follows students from the end of secondary school to end of the university would provide a more reliable answer. Another possible approach may be to follow students from different departments who have the same scores at the beginning of their

university education and to test them at the end of the fourth year. In this way, the gains due to education can be more precisely assessed.

Effect of sex on cognitive and moral development

Although not planned at the beginning, the variable of sex was also investigated. Some research shows no sex differences (Bar-Yam, Kohlberg, & Naame, 1980; Snarey, 1985; Rest, 1985; Rest, 1986; Zeidner & Nevo, 1987). But, Thoma conducted a meta-analysis on the accumulated DIT data of 56 samples, comprising 6000 male and female subjects, and he found that at every age/education level, females scored significantly higher than males (Moon, 1986). In Park and Johnson's study (1984) Rest's DIT was administered to Korean male and female high school and college students. Females showed significantly more responses demonstrating principled morality than did males. In the study examining the relationships among cognitive development, role-taking abilities, and moral development, Krebs and Gillmore (1982) also found sex differences in morality; females scored higher than males on moral development.

The unequal number of respondents of each sex in both departments, the small number of males in the psychology department, the small number of females in the engineering department, and the unequal distribution by sex in grades make it hard to speak confidently about the findings; however, the present study also found that females scored higher than males in principled moral reasoning.

The explanation that the differences may reflect greater role-taking experience in males than females has always been given when a sex difference

was found in favor of males (White, 1975; Bussey & Maughan, 1982). Based on the findings of the present study, can the same explanation (greater role-taking experience in females than males) be made here? The answer will be only speculation.

There is another dimension of sex differences in morality other than having high scores in the MJI or the DIT. While claiming that Kohlberg's stage theory of moral reasoning is gender biased, Gilligan (1988) proposes a model that assumes basic differences in the cognitive and affective orientations of men and women: Men focus on separateness, women on connectedness: men need a system of rights to connect themselves with other people, and for them morality is conceptualized as justice in terms of rules and rights, while on the other hand, women seem to focus on interpersonal relationships, including issues of care and responsibility. She further claims that Kohlberg's methodology does not recognize that for women the complex and multidimensional nature of real-life decisions supersedes issues of rights and justice. But research has not supported her claim that only males use justice-based moral reasoning and only females use care-based moral reasoning (Ford & Lowery, 1986; Garrod & Beal, 1993; Daniels, D'Andrea, & Heck, 1995). The findings of these studies assert that both males and females select justice or care perspectives with equal likelihood. The fact that people solve a problem in one way clearly does not mean that they do not have access to other approaches.

Distribution to cognitive stages

Percentages of subjects in transitional and formal operational stages were computed. Approximately half of the psychology subjects were found to be in the Transitional stage, while in contrast most of engineering students were in the Formal Operational stage. There was no significant difference between the ages of subjects in the Transitional and Formal Operational stages in terms of age. In the present study the MDT was used to assess the level of formal operations. However, although it had a Cronbach value of .71, it seems that the validity of this measure is in question, for the reasons to be outlined below.

While working with Binet on the construction of an intelligence test, Piaget found that the children's incorrect answers to be far more interesting than the correct answers. He found that the same wrong answers occurred frequently in children of about the same ages, and came to the conclusion that the thought of younger children was qualitatively different (Ginsburg & Opper, 1969). In short, there are qualitative differences between Piaget's stages rather than quantitative differences based on the number of correct answers. The MDT, on the contrary, employs a quantitative approach. It separates formal operational thinking from the transitional or concrete operational stages by simply counting the number of correct answers, and gives cut off points to separate the stages. And the test also does not provide information about the substages of formal operational thinking such as "beginning formal operations", "early basic formal operations", and

"consolidated formal operations" (Walker & Richards, 1979). Piaget's and Kohlberg stages might be matched more precisely if the subjects' substages of formal operations were known.

The MDT has some other limitations. Of the 21 questions of the test, there are 5 items that investigate the same kind of reasoning. Instead of this, the test could include various tasks for different kinds of reasoning.

Another scale instead of MDT can be used for further research. The British Intelligence Scale which was intended to assess level of cognitive development (the test divides respondents into preoperational, concrete and formal operational stages) may be an appropriate tool for assessing formal operations (Lovell, 1971). Contrary to the MDT, this scale aims to assess various abilities. The scale has 12 subscales; Vocabulary Information, Comprehension, Matrices, Induction, Operational Thinking, Number, Koh's Blocks, Visual Spatial Visual Memory, Auditory Memory, and Creativity Subscales.

Distribution to moral stages

From the descriptive statistics it is understood that Stage 4 reasoning is more common than others among university students from both departments. Whether Stage 5a reasoning will come next in the developmental sequence or Stage 4 reasoning will continue preferred into adulthood because of its emphasis on maintenance of social order is a matter for further investigation. Why USA college students have higher principled reasoning scores that Turkish university students also needs further investigation. Moon (1986),

reviewing studies which compare non-Western versus Western cultures, found a significant difference in P scores. He concludes that the more the cultural characteristics of a sample resemble American culture, the higher the P score tends to be.

Implications of the Second Pilot Study

There are also some interesting points to mention about the second pilot study, where the stories of the DIT were given to subjects without the 12 issues of the stories. Content analysis was done on the judgments of subjects. This analysis showed that, subjects tended to use some considerations other than the issues of the DIT. For example, they suggested actions other than the two choices of the stories, they asked more information about the details of the situation of the story, and some subjects were interested in what the other character of the story should do instead of the main character's choice. These considerations resemble the findings of Cortese's (1988) study, however, there was no difference between males and females in these kinds of choices in the pilot study contrary to Cortese's findings.

Cortese questioned 70 university subjects (males and females) using Kohlberg's Moral Judgment Interview and he reported some of the same findings as the pilot study. He mentioned that some women rejected both alternatives in the Heinz dilemma and proposed other solutions to the problem, or women viewed Heinz dilemma as a communication problem, that is Heinz needed to communicate with the druggist, his friends, bank or whoever.

Cortese critizes Kohlberg because he thinks that Kohlberg uses unrealistic dilemmas; these dilemmas are unrealistic because they pose situations as having rigid either/or consequences rather than as being multidimensional. The findings of the second pilot study seem to agree with Cortese. Not choosing one of the decisions, for example "should steal" or "should not steal" may show that subjects are avoiding making judgments, because it is easier to deny the dilemmas. Or subjects feel uncomfortable in choosing, because life is not unidimensional, and they make judgments in stories as they make judgments in life. One explanation may be that subjects avoid making either/or judgments because they do not have the capacity to think hypothetically. This possibility was examined by comparing older and younger subjects and by comparing better educated and less educated subjects. No differences were found between groups preferring Category A (same as the DIT issues) or Category B (different from DIT issues) responses. Shweder et al. (1985) state that the abstract individual is the fundamental entity in Kohlberg's scheme because society is viewed as a logically derivate product, formed when abstract individuals enter into a social contract. Critics of Kohlberg have claimed that stages of moral judgment have little to do with social reality (Harkness & Edwards, & Super, 1981). "Real" moral judgment is rather contextual, requiring interpretation, comprehension, and ordering of considerations. In his study, Kurtiness (1986) asserted that moral choices are complex decisions mediated by both individual differences and situational constraints. The content analysis of the second pilot study suggest that subjects used the kind of considerations which were called "care" considerations by Gilligan. These are interpersonal responsibility,

interpersonal communication, and context-based considerations. Finding no difference between ages, sexes and education levels of subjects in preference for these kind of considerations may suggest that Kohlberg and Rest neglect something very important while trying to collect the reasoning of subjects about the dilemmas of Moral Judgment Interview and the DIT. Reasoning in very strict hypothetical situations does not tell us about the reasoning of subjects in real life situations, because real life is not one-dimensional, and is more chaotic than in the dilemmas. It seems that morality should be investigated with more emphasis on the context.

Conclusion

The finding that there is no relationship between cognitive development and moral development implies that these two developmental domains are independent. This independence means that they depend on different sets of organism-environment interactions, and change in one domain does not imply change in the other domain (Kuhn et.al., 1977). Different sets of organism-environment interactions bring us to the importance of education in the course of development of independent domains. The finding that type of education has an effect on both cognitive development and moral development should be of interest to educators and parents. Identification of the elements of the educational process which lead to cognitive development, and the elements which lead to moral development, would make it possible to incorporate both types of element into all types of curriculum, promoting both kinds of development in all students.

Finally, morality is a topic which deserves more research using a variety of different methods besides those using abstract dilemmas.

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Tarih:

İsim:
Yaş:
Cinsiyet:
Okul \ Bölüm:
Sınıf:

SOSYAL PROBLEMLER HAKKINDAKİ DÜŞÜNCELER

Bu anketin amacı, insanların sosyal problemler hakkında ne düşündüğünü bulmaktır. Buradaki doğru ve yanlış soruları hakkında, farklı insanlar genellikle farklı düşüncelere sahiptirler; matematik sorularına verilen doğru cevaplar gibi 'kesin doğru' cevaplar yoktur. Sizden, birkaç hikayedeki problemler hakkında ne düşündüğünüzü anlatmanızı bekliyoruz.

Aşağıda örnek bir hikaye ve örnek cevaplar görmektesiniz.

* * * * * * * * *

Fikret Bey, bir araba almayı düşünmektedir. Evlidir, iki küçük çocuğu ve ortalama bir geliri vardır. Alacağı araba, ailesinin ilk arabası olacaktır. Araba çoğunlukla işe gitmek ve şehirde dolaşmak için, bazen de kısa seyahatler yapmak için kullanılacaktır. Ne tür bir araba alacağına karar vermeye çalışırken, Fikret Bey gözönüne alması gereken pek çok sorunun farkına varır. Aşağıda bu sorulardan bazılarının listesi bulunmaktadır.

Eğer siz Fikret Bey olsaydınız, aşağıdaki soruların herbiri, hangi arabayı alacağınızı belirlemede ne kadar önemli olacaktı?

ÖNEM DERECESİ:

Büyük	Çok	Biraz	Az	Hiç	
				✓	*1-* Araba satıcısının Fikret Beyle aynı mahallede oturup oturmadığı (Diyelim ki, bu konu sizin için hiç de önemli değil. O zaman sol taraftaki kutulardan ***'Hiç'*** in altına bir işaret koyacaksınız)
✓					*2-* Kullanılmış bir arabanın, uzun vadede yeni bir arabadan daha ekonomik olup olmayacağı (Araba alırken bu sorunun en önemli sorunlardan biri olduğunu düşündüğünüzü varsayalım, bu durumda en soldaki ***'Büyük'*** kutusunun altına bir işaret koyacaksınız)

		✓			3- Arabanın renginin, Fikret Beyin favori rengi olan yeşil olup olmadığı (Bunun ***'Biraz'*** önemi olduğunu düşünelim)
				✓	4- Santimetreküp kaymasının en azından 2000 olup olmadığı (`Santimetreküp kayması`nın ne olduğundan emin değilseniz, ***'Hiç'*** kutusunu işaretleyeceksiniz)
✓					5- Geniş, ferah bir arabanın küçük bir arabadan daha iyi olup olmayacağı (Bunun da sizin için ***'Büyük'*** önemi olduğunu düşünelim)
				✓	6- Ön mensanların entegre olup olmadığı (Size saçma gelen bir cümle olduğunda **'Hiç'** kutusunu işaretleyeceksiniz)

Yukardaki soru listesinden, en önemlisini seçiniz. En önemli sorunun numarasını aşağıda, en uste yazınız. İkinci, üçüncü, dördüncü önemli seçenekler için de aynı şeyi yapınız (En önemli seçeneklerin en soldaki kutularda işaretli olanlardan seçildiğine dikkat ediniz. 2. ve 5. soruların çok önemli olduğu düşünülmüştür; en önemlisinin hangisi olduğuna karar verirken, 2. ve 5. sorular yeniden okunacak ve ikisinden biri en önemli olarak seçilecektir. Sonra da diğeri, ikinci önemli bölümüne yazılacak ve bu böyle devam edecektir.

En önemli 5
İkinci önemli 2
Üçüncü önemli 3
Dördüncü önemli 1

HASAN VE İLAÇ

Kasabanın birinde bir kadın özel bir kanser türü yüzünden ölmek üzereydi. Doktorlara göre onu kurtarabilecek tek bir ilaç vardı. Bu ilaç aynı kasabadaki bir eczacının yakınlarda keşfettiği bir ilaçtı. İlacın yapımı pahalıya malolmuştu, ancak eczacı maliyetin on katı kadar para talep ediyordu: Hammaddesi için 200 dolar ödemişti, küçük bir dozda ilaç içinse 2000 dolar istiyordu. Hasta kadının kocası Hasan, borç para alabilmek için tanıdığı herkese gitti, fakat sadece 1000 dolar toparlayabildi ki bu istenen paranın ancak yarısı kadardı. Hasan eczacıya karısının ölmek üzere olduğunu anlattı ve ondan ilacı ucuza satmasını veya parayı daha sonra ödemesi için kolaylık göstermesini rica etti. Fakat, eczacı, "Hayır, bu ilacı ben buldum ve bundan para kazanacağım." diye karşılık verdi. Böylece Hasan umutsuzluğa kapıldı ve gizlice eczacının dükkanına girmeyi ve karısı için ilacı çalmayı düşünmeye başladı.

Hasan ilacı çalmalı mı? (Seçeneklerden birini işaretleyiniz)

----- Çalmalı -----Karar veremiyorum -----Çalmamalı

ÖNEM DERECESİ:

Büyük	Çok	Biraz	Az	Hiç	
					1- Kanunlara uyulup uyulmayacağı
					2- Karısını seven bir kocanın, karısı için hırsızlık yapacak kadar endişelenmesi doğal değil midir?
					3- İlacı çalmanın faydası dokunabileceği ihtimaline karşılık olarak, Hasan bir soyguncu gibi vurulmaya ya da hapse girmeyi göze almaya razı mı?
					4- Hasan'ın profesyonel bir güreşçi olup olmadığı veya güreşçiler üzerine etkisinin bulunup bulunmadığı
					5- Hasan'ın kendisi için mi yoksa yalnızca başka birine yardım etmek için mi hırsızlık yaptığı
					6- Eczacının keşfinin haklarına saygı gösterilmeli mi?
					7- Yaşamın özünün toplumsal ve bireysel açıdan ölümün getirdiği nihayete göre daha kapsamlı olup olmadığı
					8- İnsanların birbirlerine karşı nasıl davranacaklarını belirlemek için hangi değerlerin temel alınacağı
					9- Eczacının, yalnızca zenginleri koruyan değersiz bir kanunun arkasına sığınmasına izin verilip verilmeyeceği
					10- Bu olayda, yasaların toplumdaki herhangi bir bireyin en temel hakkına engel teşkil edip etmediği
					11- Eczacının böylesine açgözlü ve zalim olması nedeniyle soyulmayı hakedip etmediği
					12- Böyle bir durumda hırsızlığın tüm toplumun iyiliğine olup olmayacağı

Yukardaki soru listesinden en önemli dört tanesini seçiniz.

En önemli ----------
İkinci önemli ----------
Üçüncü önemli ----------
Dördüncü önemli ----------

KAÇAK MAHKUM

Adamın biri on yıllık bir hapse mahkum olmuştu. Nasıl olduysa, bir yıl sonra hapisten kaçmayı başardı, uzakta bir şehre yerleşti ve Mahmut ismini kullanmaya başladı. Sekiz yıl boyunca çok çalıştı ve zamanla kendi işini açacak kadar sermaye biriktirdi. İşinde, müşterilerine karşı adildi, çalışanlarına dolgun ücret veriyor ve karının büyük kısmını hayır işlerine harcıyordu. Bir gün, eski bir komşusu olan Zeynep Hanım, onun sekiz yıl önce hapishaneden kaçmış olan ve polis tarafından aranan bir mahkum olduğunun farkına vardı.

Zeynep Hanım, Mahmut Beyi polise ihbar edip onu hapse attırmalı mı?
(Seçeneklerden birini işaretleyiniz)

-----İhbar etmeli -----Karar veremiyorum -----İhbar etmemeli

ÖNEM DERECESİ:

Büyük	*Çok*	*Biraz*	*Az*	*Hiç*	
					1- Mahmut Bey, aslında kötü bir insan olmadığını ispatlayacak kadar uzun süre, iyi davranmamış mıdır?
					2- Bir suçun cezalandırılmasından kaçan her bir kimse, sadece daha çok suçun işlenmesini teşvik etmez mi?
					3- Hapishane ve kanun sistemlerinin zulümleri olmaksızın daha mutlu olmaz mıydık?
					4- Mahmut Bey, topluma olan borcunu gerçekte ödemiş midir?
					5- Toplum, Mahmut Beyin haklı beklentilerini yerine getiremeyecek mi?
					6- Hapishanelerin, toplum bir yana, özellikle hayırsever bir insana ne faydası olacaktır?
					7- Bir insan, nasıl Mahmut Beyi hapse gönderecek kadar kalpsiz ve zalim olabilir?
					8- Eğer Mahmut Bey serbest kalırsa bu, cezalarının hepsini tamamlamakta olan mahkumlara karşı adil olur mu?
					9- Zeynep Hanım, Mahmut Beyin yakın bir arkadaşı mıdır?
					10- Koşullar ne olursa olsun, kaçak bir suçluyu ihbar etmek her vatandaşın görevi değil midir?
					11- Halkın iradesine ve toplumun yararına en iyi nasıl hizmet edilir?
					12- Hapse dönmek, Mahmut Beyin yararına mı olacak ya da herhangi birinin korunmasını sağlayacak mı?

Yukardaki soru listesinden, en önemli dört tanesini seçiniz.

En önemli ----------

İkinci önemli ----------

Üçüncü önemli ----------

Dördüncü önemli ----------

DOKTORUN İKİLEMİ

Kadının biri, tedavi edilemeyen bir kanser türü yüzünden ölmek üzereydi, sadece 6 aylık ömrü kalmıştı. Çok acı çekiyordu. Öylesine zayıftı ki morfin gibi güçlü bir ağrı kesici onun ölümünü çabuklaştırabilirdi. Ağrıdan neredeyse çıldırmak üzereydi, sakin bir devresinde doktordan kendisini öldürmeye yetecek kadar morfin vermesini istedi. Acıya dayanamadığını ve zaten birkaç ay içinde öleceğini söyledi doktora.

Doktor ne yapmalı? (Seçeneklerden birini işaretleyiniz)

-----Morfini vermeli -----Karar veremiyorum -----Morfini vermemeli

ÖNEM DERECESİ:

Büyük	*Çok*	*Biraz*	*Az*	*Hiç*	
					1- Kadının ailesinin yüksek dozu verme taraftarı olup olmadığı
					2- Eğer aşırı doz vermek, kadını öldürmekle eşdeğerse doktor da herkes gibi aynı kanunlara karşı mı sorumludur?
					3- Toplum insanların hayatlarına ve hatta ölümlerine karışmasa, onlar için daha iyi olmaz mı?
					4- Doktorun bu olayı bir kaza gibi gösterip gösteremeyeceği
					5- Devletin ölmek isteyenleri yaşamaya zorlamaya hakkı var mı?
					6- Toplumun, kişisel değerlere bakış açısında, öncelikli olarak ölümün rolü nedir?
					7- Doktorun kadının çektiği acıya mı yoksa toplumun ne düşündüğüne mi önem verdiği
					8- Bir başkasının ölmesine yardım etmenin sorumlu bir işbirliğinin örneği olup olmayacağı
					9- Bir insanın ölümü hakkındaki kararın yalnızca Allah'a ait olup olmadığı
					10- Doktorun ne gibi değerler benimsediği
					11- Herkesin istediği zaman hayatına son vermesi topluma zarar verir mi?
					12- Toplum, bir yandan intihar etmek isteyenlere ve merhamet gereği başkalarının ölmelerine yardım edenlere izin verirse, yaşamak isteyen kişilerin hayatlarını yeterince koruyabilir mi?

Yukardaki soru listesinden, en önemli dört tanesini seçiniz.

En önemli _____

İkinci önemli _____

Üçüncü önemli _____

Dördüncü önemli _____

FARUK BEY

Faruk Bey, bir tamir istasyonunun sahibi ve yöneticisiydi. Kendisine yardımcı olabilecek başka bir teknisyen daha tutmak istiyordu, fakat iyi bir teknisyen olarak bulabildiği tek kişi, Zeki Beydi, ancak o da bir çingeneydi. Faruk Bey, çingenelere karşı olmadığı halde, Zeki Beyi tutmaya çekiniyordu, çünkü pek çok müşterisi çingenelerden hoşlanmıyordu. Zeki Bey, istasyonda çalıştığı taktirde, Faruk Bey müşterilerinin çoğunu kaybedebilirdi.

Zeki Bey, Faruk Beye işe alınıp alınmadığını sorduğunda Faruk Bey, ona başka birini tuttuğunu söyledi. Fakat Faruk Bey, gerçekte kimseyi işe almamıştı, çünkü Zeki Beyden başka iyi bir teknisyen bulamamıştı.

Faruk Bey ne yapmalıydı? (Seçeneklerden birini işaretleyiniz)

-----İşe almalıydı -----Karar veremiyorum -----İşe almamalıydı

ÖNEM DERECESİ

Büyük	*Çok*	*Biraz*	*Az*	*Hiç*	
					1- Bir işyeri sahibinin kendi iş kararlarını verme hakkına sahip olup olmadığı
					2- İşe alma konusunda ırk ayrımını yasaklayan bir kanun olup olmadığı
					3- Faruk Beyin, Zeki Beyi işe almaması çingenelere karşı olan önyargısından mı kaynaklanıyor?
					4- İş açısından, iyi bir teknisyeni işe almanın mı yoksa müşterilerinin isteklerini dikkate almanın mı daha yararlı olacağı
					5- Toplumsal roller açısından hangi bireysel farklılıklar daha önemli olmalıdır?
					6- Açgözlü ve rekabetçi kapitalist sistemin tamamen terkedilip terkedilmemesi gerektiği
					7- Faruk Beyin çevresindeki insanların çoğunluğunun müşterileri gibi mi hissettiği yoksa ırk ayrımına karşı mı olduğu
					8- Aksi taktirde toplum dışına atılacak olan Zeki Bey gibi kişilerin yeteneklerinden faydalanıp faydalanılamayacağı
					9- Zeki Beyi işe almayı reddetmesi, Faruk Beyin kendi ahlaki görüşleriyle tutarlı olacak mıdır?
					10- Faruk Bey, Zeki Bey için işin ne kadar önemli olduğunu bilerek ona işi vermeyi reddedecek kadar katı kalpli biri olabilir mi?
					11- 'Başkalarının iyiliğini düşün' kuralının bu olayda geçerli olup olmadığı
					12- Eğer bir insanın yardıma ihtiyacı varsa, ondan karşılık olarak ne alınacağı düşünülmeden yardım edilmeli midir?

Yukardaki soru listesinden, en önemli dört tanesini seçiniz.

En önemli ----------

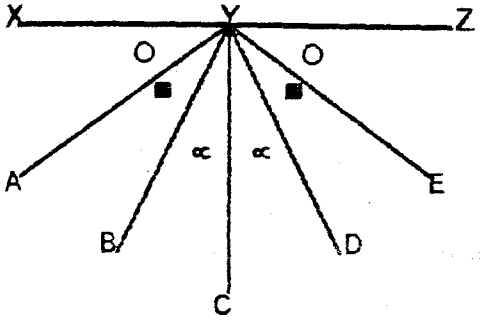
İkinci önemli ----------

Üçüncü önemli ----------

Dördüncü önemli ----------

İsim: *Okul \ Bölüm:*
Yaş: *Cinsiyet:* *Sınıf:*

1.Aşağıdaki şekilde XYZ doğrusu bir duvarı göstermektedir. Bir top hep Y noktasına çarpacak şekilde duvara atılmaktadır.

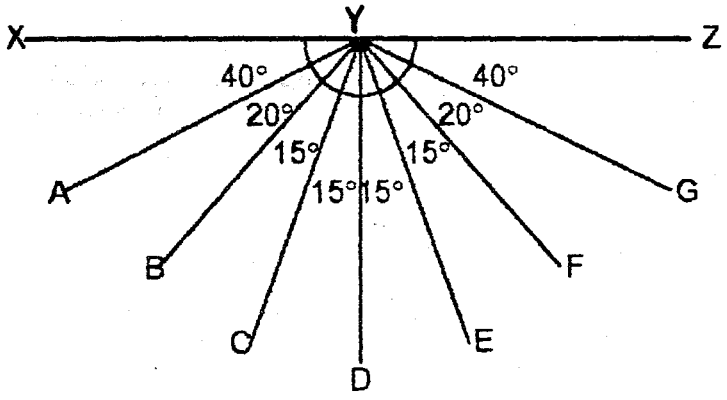


Aynı şekilli açılar birbirine eşittir.

Eğer top Y noktasından B'ye giderse hangi noktadan atılmıştır?

(a) A (b) B (c) C (d) D

Aşağıdaki şekil birinci soruda verilen şekle çok benzemektedir. 2. ve 3. soruları cevaplamak için bu şekli kullanın.



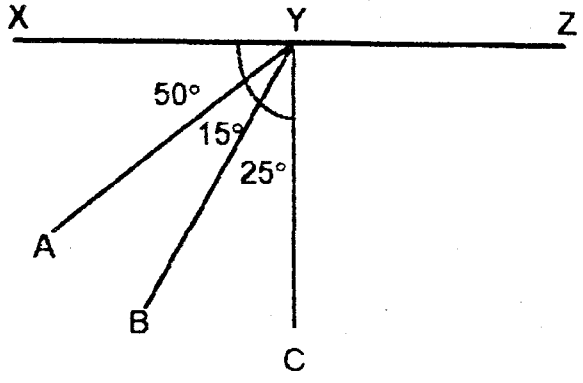
2.Eğer top B noktasından duvardaki Y noktasına atılırsa , hangi noktaya gidecektir?

(a) A (b) E (c) F (d) G

3.Eğer top duvardaki Y noktasından A noktasına giderse, hangi noktadan atılmıştır?

(a) A (b) E (c) F (d) G

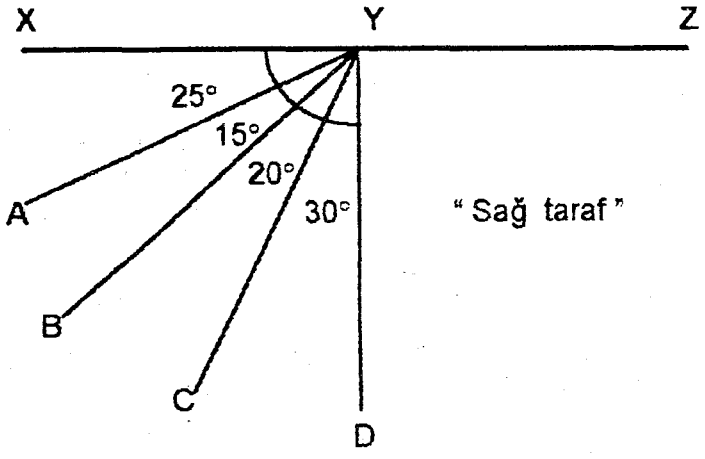
4.Aşağıdaki şekilde bir top A noktasından , duvardaki Y noktasına atılmıştır.



Top duvara çarptıktan sonra dönüşte izlediği yol, CY doğrusuyla kaç derecelik bir açı yapar?

(a) 15 (b) 25 (c) 40 (d) 50

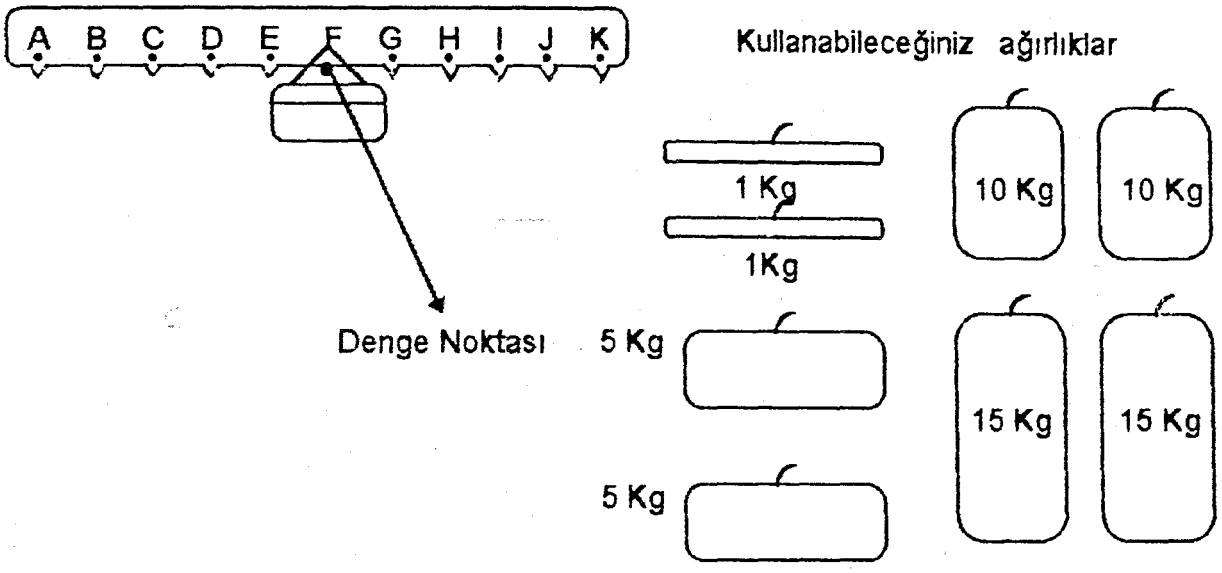
5.



Bir top şekilde "sağ taraf" yazılı kısımdan atılıyor. Y noktasında duvara çarpıyor ve C noktasına gidiyor. Topun atıldığı noktayı Y noktasına birleştiren doğru ile ZY çizgisi arasında kalan açı kaç derecedir?

(a) 60 (b) 40 (c) 50 (d) 65

Elinizde aşağıdaki şekilde gösterilene benzer bir terazi olduğunu düşünün. Şekli dikkatle inceleyin ve 6. ve 7. sorulara bu şekli kullanarak cevap verin.



6.D noktasına 5 kg 'lık bir yük takılırsa, teraziyi nasıl dengelersiniz?

(a) A'ya 1 kg takarak
(b) J'ye 10 kg takarak
(c) H'ye 5 kg takarak
(d) K'ye 5 kg takarak

7.E noktasına 5 kg'lık , C noktasına da 10 kg'lık bir yük takılırsa, teraziyi nasıl dengelersiniz?

(a) G'ye 5 kg ve J'ye 10 kg takarak
(b) H'ye 10 kg ve K'ye 1 kg takarak
(c) I'ya 15 kg ve H'ye 1 kg takarak
(d) I'ya 10 kg ve G'ye 5 kg takarak

8.-10. sorular kıyaslamalı sorulardır. Herbiri iki önerme ve bir sonuçtan oluşur. Sonuç iki önermenin birleşmesinden meydana gelir. Aşağıdaki sorularda iki önermenin birleşmesinden meydana gelen sonucu bulunuz.

Örnek:
I.Önerme: Bir ,yaşındaki hiçbir bebek yürüyemez.
II.Önerme: Ali bir yaşında bir bebektir.
(a) Ali yürüyebilir.
(b) Ali yürüyemez.
(c) Bütün bebekler bir yaşındadır.
(d) Bebekler yürüyemez.

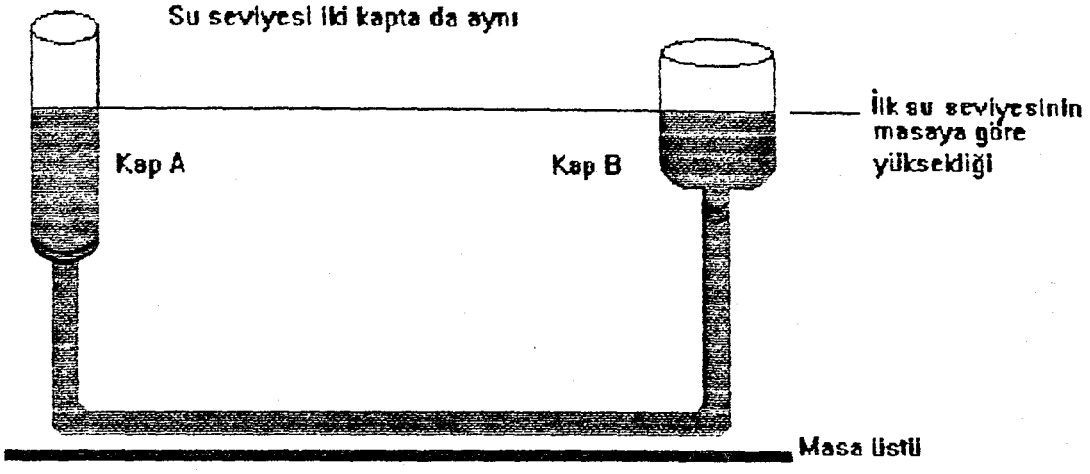
Bu soruda iki önermenin birleşmesinden "Ali yürüyemez" sonucunu çıkarırız. Buna göre cevap (b) seçeneğidir.

8. I.Önerme: Bazı R'ler T değildir.
II.Önerme: Bütün T'ler M'dir.
(a) Bütün T'ler R'dir.
(b) Bazı T'ler M değildir.
(c) Bütün R'ler M'dir.
(d) Bazı R'ler M değildir.

9. I.Önerme: Bütün kömürler beyazdır.
II.Önerme: Bütün beyaz kömürler yanarken kırmızı duman çıkartırlar.
(a) Kömür yanarken dumanı gri olur.
(b) Kömür yanarken dumanı kırmızı olur.
(c) Beyaz olmayan kömürler yanmaz.
(d) Bazı kömürler siyahtır.

10. I.Önerme: Ali Ayşe'ye kızdığında ona vurur.
II.Önerme: Ali şimdi Ayşe'ye kızgın değildir.
(a) Ali Ayşe'ye kızmaz.
(b) Ali şimdi Ayşe'ye vuracak.
(c) Ayşe Ali'ye hiç vurmaz.
(d) Ali şimdi Ayşe'ye vurmayacak.

Aşağıdaki şekil içi su dolu üstü açık, iki kabı göstermektedir. İki kabı birbirine bağlayan hortum sayesinde, birindeki su diğerine geçebilmektedir. B kabının çapı A kabının çapından büyüktür. 11. ve 12. soruları cevaplamak için bu şekli kullanın.



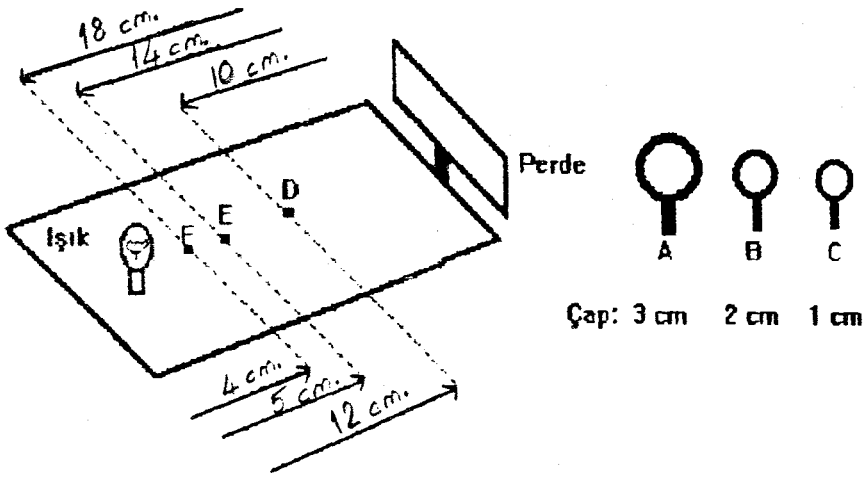
11. A ve B kabı birlikte eşit miktarda aşağıya indirildi. Kapların içindeki su seviyesi ilk su seviyesine göre ne olacaktır?

(a) A'daki su seviyesi daha yukarda, B'deki su seviyesi daha aşağıda olacaktır.
(b) B'deki su seviyesi daha yukarda ve A'daki su seviyesi daha aşağıda olacaktır.
(c) Her iki kaptaki su seviyesi de eşit miktarda yukarda olacaktır.
(d) Her iki kaptaki su seviyesi de aynı miktarda aşağıda olacaktır.

12. A ve B kabı birlikte eşit miktarda yukarıya kaldırıldı.Kapların içindeki su seviyesi ilk su seviyesine göre ne olacaktır?

(a) Her iki kaptaki su seviyesi de eşit miktarda aşağıda olacaktır.
(b) Her iki kaptaki su seviyesi de eşit miktarda yukarıda olacaktır.
(c) A kabındaki su seviyesi daha yukarıda, B kabındaki su seviyesi daha aşağıda olacaktır.
(d) B kabındaki su seviyesi daha yukarıda, A kabındaki su seviyesi daha aşağıda olacaktır.

Aşağıdaki alet perdede gölgeler oluşturmak için kullanılır. A, B ve C halkaları perde ile ışık arasında herhangi bir noktaya yerleştirilebilir. Şekilde D, E ve F noktalarının perdeye uzaklıkları üstte, bu noktaların ışığa olan uzaklıkları ise altta gösterilmiştir. 13. ve 14. sorular için bu şekli kullanın. (Sorularda sözedilen gölgeler bu halkaların yuvarlak kısımlarının gölgeleridir.)



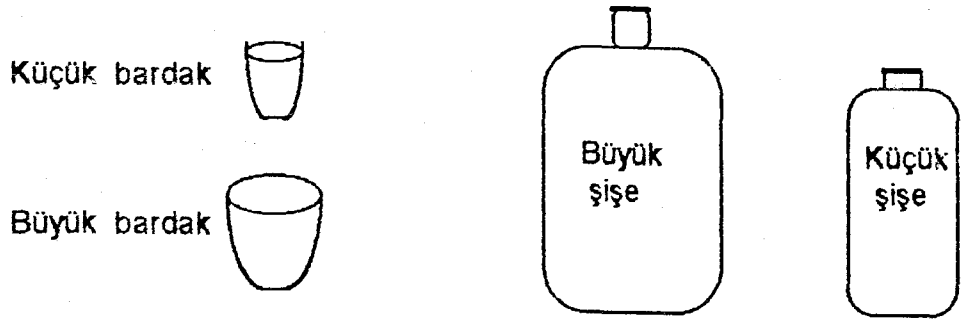
13. A halkası D noktasına yerleştirildi ve perdedeki gölgesinin büyüklüğü ölçüldü. Sonra A halkası kaldırıldı ve yine D noktasına B halkası yerleştirilip, gölgesinin büyüklüğü ölçüldü. A ve B'nin gölgeleri ;

(a) Aynı büyüklükte olurlar.
(b) A'nın gölgesi B'nin gölgesinden büyük olur.
(c) B'nin gölgesi A'nın gölgesinden büyük olur.
(d) A'nın gölgesi B'nin gölgesinden küçük olur.

14. D noktasına önce B halkası yerleştirildi ve perdedeki gölgesinin büyüklüğü ölçüldü. Sonra B halkası kaldırıldı ve yine D noktasına C halkası yerleştirildi ve perdedeki gölgesinin büyüklüğü ölçüldü. B ve C'nin gölgeleri;

(a) Aynı büyüklükte olur.
(b) B'nin gölgesi C'nin gölgesinden daha büyük olur.
(c) C'nin gölgesi B'nin gölgesinden daha büyük olur.
(d) B'nin gölgesi C'nin gölgesinden daha küçük olur.

Aşağıdaki şekilde iki şişe (bir büyük, bir küçük) ve iki bardak (bir büyük, bir küçük) görüyorsunuz. 15. soru için bu şekli kullanın.



15. Küçük şişeyi doldurmak için 6 büyük bardak veya 9 küçük bardak su gerekiyor. Eğer büyük şişe 8 büyük bardak su ile doluyorsa , yine büyük şişeyi doldurmak için kaç küçük bardak su gereklidir?

(a) 10 (b) 12 (c) 15 (d) 16

16.-21. sorulara <u>sözel ilişkiler</u> adı verilir. <u>Sözel ilişkiler</u>, aynı ilişkiyi içeren iki sözcük çiftinden oluşur. Aşağıdaki sorularda aynı ilişkiye sahip iki sözcük çiftinden oluşan seçeneği bulun.

Örnek:

(a) "içeri-dışarı"	ile	"aşağı-yukarı"
(b) "açık-kapalı"	ile	"yanlış-hata"
(c) "eski-yeni"	ile	"yaşlı-ihtiyar"
(d) "güzel-çirkin"	ile	"soğuk-serin"

Bu örnekte doğru cevap (a) seçeneğidir. "<u>içeri-dışarı</u>" ile "aşağı-yukarı" sözcük çiftleri arasındaki ortak ilişki ikisinin de birbirinin zıttı olmasıdır. Diğer seçeneklerde iki sözcük çifti arasında ortak bir ilişki yoktur.

Aşagıdaki sorularda da aynı ilşkiye sahip iki sözcük çiftini bulun

16. (a) "ders-çalışma"	ile	"soru-cevap"
(b) "görev-tamamlama"	ile	"problem-çözüm"
(c) "sınav-hazırlanma"	ile	"yarış-kazanma"
(d) "dönem-kazanma"	ile	"deney-inceleme"

17.	(a) "ampul-elektrik"	ile	"kibrit-alev"
	(b) "ütü-priz"	ile	"bitki-su"
	(c) "bisiklet-pedal"	ile	"sandal-kürek"
	(d) "araba-motor"	ile	"gemi-buhar"
18.	(a) "yürümek-insan"	ile	"uçmak-kanat"
	(b) "ayak-vücut"	ile	"tekerlek-bisiklet"
	(c) "ağaç-kök"	ile	"araba-fren"
	(d) "parmak-el"	ile	"at-nal"
19.	(a) "arı-kovan"	ile	"ağaç-orman"
	(b) "koyun-sürü"	ile	"asker-tabur"
	(c) "çiçek-demet"	ile	"yaprak-dal"
	(d) "tavuk-kümes"	ile	"iskambil-deste"
20.	(a) "göz-gözkapağı"	ile	"koltuk-minder"
	(b) "şapka-kafa"	ile	" battaniye-yatak"
	(c) "kürk-tilki"	ile	"deri-çanta"
	(d) "resim-boya"	ile	"mektup-zarf"
21.	(a) "telefon-ses"	ile	"radyo-müzik"
	(b) "daktilo-zarf"	ile	"piyano-nota"
	(c) "televizyon-anten"	ile	"makine-vida"
	(d) "saat-yelkovan"	ile	"termometre-derece