When to Intend for Genetic Testing: Positive Attitudes, Eagerness to Learn Health

Information, Cancer Anxiety, and Family Experiences

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Abstract

Genetic testing can identify the vulnerability of individuals toward certain illnesses long time before their emergence. Although advances in this method offer various early prevention opportunities for serious illnesses including some types of cancer, individuals may refrain from learning their individual risks due to mortality salience. This study aimed to develop intervention strategies via construal level manipulation and symbolic consumption consideration to examine differing coping strategies, and reviewed individual differences related to cancer risk perception. Results showed that neither construal level manipulation nor consideration of symbolic consumption was effective to lead individuals to different coping strategies for the study sample. However, individual differences in terms of social cognition, attitudes, and demographics were identified for increased intention to take genetic testing. Decision tree analyses revealed that being anxious for getting cancer was a motivating factor for genetic test intention; whereas reluctance to learn individual health information impeded this intention. Moreover individuals with positive attitudes for getting genetic test and, witnessing a family member with cancer were found to have higher intention for getting genetic testing. These findings can be directive for further research and generating effective communications for increasing genetic test intention.

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Cancer is a major cause of death all over the world. International Agency for Research on Cancer (IARC) reported that 7.6 million people around the world died of cancer in 2008 (approximately 13% of all deaths), this number raised to 8.2 million in 2012 (Globocan, 2014) and the death number is projected to increase to 13.1 million in 2013 (Globocan, 2010). According to World Health Organization (WHO, 2013), 30% of deaths in 2008 could be prevented. Thus, prevention and early detection practices are of utmost importance. For example, cancer screening practices are conducted to detect signs of cancer for an individual (e.g., pap smear test for cervical cancer, mammography for breast cancer); whereas genetic tests are utilized to determine the genetic tendency of an individual for getting particular illnesses including some types of cancers.

Although the ultimate aim is to decrease level of suffering and death rate, implications and therefore responses for screening and genetic testing can diverge from each other. Cancer screenings provide instant results (i.e., whether the individual has cancer or not) and hence require concrete responses (i.e., getting treatment or not). On the other hand, genetic test results provide vulnerability scores and these scores leave the individual with long term decision alternatives, the results of which are not specific (e.g., continuous screening, healthy dieting, exercising).

Despite the fact that prevention and early detection practices are shown to reduce cancer susceptibility and increase cancer survival (e.g., Gerbes & Jungst 1994; Hartmann et al., 1999), there are many barriers to these practices ranging from anxiety and worry to fatalism (e.g., Greiner et al., 2005; McQueen et al., 2008; Weitzman et al., 2001). People report such negative feelings or fatalist beliefs because thinking about cancer or being urged to take precautions for cancer reminds them of their inevitable death. In the case of cancer

screening, the likelihood of having cancer may make people worried. Genetic testing, similarly, can make people anxious about learning their cancer susceptibility. It is also possible that people may be unrealistically optimistic regarding their perceived cancer risk (Facione, 2002); therefore, they may not be motivated to learn their likelihood. It is also possible that people may associate cancer with death in an unconscious manner (Arndt et al., 2004) and this unconscious association may make them uncomfortable. But given the absence of conscious deliberation, taking preventive measures can hardly come to mind.

Genetic Testing as a Cancer Preventive Method

By giving information about individual health risks, genetic testing can provide opportunities for early detection, surveillance, and intervention (Smith, Cokkinides, & Brawley, 2008). However, the fact that genetic testing does not provide a concrete result but a likelihood score for cancer susceptibility may generate some resistance. If the likelihood score is low, people may feel relieved and continue doing risky behaviors like unhealthy dieting or smoking. On the other hand, if the likelihood score is high, people may become restless for the high chance of getting cancer and may not engage in any preventive behaviors due to inertia. In both cases, the following responses vary according to the perspective of individuals. Identification of individuals' different responses related to cancer attitudes and preventive intentions in this context is thus needed. One goal of the present research is to identify some of these responses. Another goal is to examine the influence of general individual differences pertaining to health and cancer on genetic test intentions.

Despite being aware of benefits, people may resist learning risks detected by genetic testing because of anxiety, fear of death, or unrealistic risk optimism. Therefore, a tendency to suppress excessive anxiety due to mortality salience can divert people from proximal coping (e.g., learning the likelihood of cancer susceptibility and acting preventively) to distal coping instead (e.g., distancing oneself from the health risks). Proximal coping requires an integrated

perspective to realize the relationships between various behaviors like conducting genetic testing and adopting a healthier diet. Nevertheless, distal coping alienates individuals from the actual causes and directs them toward momentary relaxations like shopping after feeling anxious.

This study aimed to reveal conditions to ensure a direct coping strategy for individuals when they got anxious for receiving genetic susceptibility information, especially for cancer. For individuals who do not face their anxiety directly and prefer to decrease it via distracting themselves, an alternative anxiety diminishing strategy was also analyzed. Basically, it has been proposed that individuals' mind-sets affect the selection of a coping mechanism when faced with a threat to their existence. Two types of mind-sets differing in specification have been examined. A concrete mind-set refers to a restricted perspective in information processing with a short-term orientation; an abstract mind-set refers to an interrelated perspective with a long-term orientation. When possible responses to mortality salience are considered for genetic testing, proximal coping should aid from utilizing an abstract mind-set to realize far reaching interrelations and to take long-term precautions. On the contrary, distal coping should be associated with concrete mind-set with its present-biased and quick-tempered approach. The results coming from the current sample of this study did not support the proposed effects considering construal levels. Possible explanations are stated in the discussion section.

The main goal of this study was to explore the potential positive effect of abstract mind-set on anxiety buffering when individuals face the uncertainty brought by genetic testing results. In a different context and with abstraction of self, Cavanaugh and Sweeny (2012) showed the anxiety decreasing effect of self-construal abstractness on uncertain and self-relevant outcomes. While applying the mind-set effect to genetic testing, the current study further aimed to eliminate barriers for the genetic testing decision if stayed in concrete

mind-set. Distal coping in the form of symbolic consumption consideration was analyzed as a way to prevent anxiety level from increasing to a level that prevents comprehension of risk information and genetic testing adherence. Again, this expectation was not supported in the present study. The possible reasons of these results related to sample characteristics will be discussed later.

Effects of Mortality Salience

As many of the barriers for cancer screening and prevention pertain to death, understanding the implications of death awareness is essential. Terror management theory (Solomon, Greenberg, & Pyszczynski, 1991) postulates that mortality salience increases existential anxiety because dying is inescapable for each individual. Cancer is often considered as a painful dying possibility and even considering actions to decrease its susceptibility or severity can be irritating. Therefore, some people try to get rid of uncomfortable feelings of mortality when faced with a cue that reminds them of death. According to this framework, ways in which people deal with mortality anxiety are construed under two different coping styles: Proximal and symbolic.

Proximal Coping for Mortality Salience

Proximal coping refers to the direct actions to rationalize and/or suppress the thought of death especially when it is at conscious level. Arndt et al. (2004) offer that proximal coping may refer to the behaviors adopted as "rationally oriented cognitive distortions" that reject vulnerability to an approaching death. They give the example of proactive health developing behaviors because these behaviors promise immunity against fatal illnesses.

In other words, proximal coping means defending the self via forming close associations with a distractive thought and fighting against these associations in a direct way. For instance, as some illnesses are direct causes of death, individuals should protect themselves from these illnesses to decrease their anxiety due to death possibility. Therefore,

individuals using proximal coping strategies can be expected to be more inclined to take genetic tests.

Symbolic Coping for Mortality Salience

The second coping mechanism is mostly associated with delays as a result of irritation caused by mortality salience, cognitive load or unconscious mortality salience (Arndt et al., 2004). This coping is called symbolic or distal coping and is related to unaided negative affect due to existential anxiety. Being aware of the restlessness, people may try to enhance their self-esteem by resorting to culturally valued prescriptions. Hedonic consumption is often given as an example for such indirect ways of dealing with existential anxiety for Western, industrialized cultures (Arndt et al., 2004).

Symbolic coping mechanism by nature has less to do with health preventive behaviors, such as genetic testing. It has a pleasure-oriented, present-biased nature with ignorance of long-term interrelations. In addition to cultural value adherence, Arndt, Greenberg, and Cook (2002) found that when primed with mortality, the accessibility of nationalistic constructs increased for men and accessibility of romanticism increased for women. So, rather than concentrating on direct causes of distraction, symbolic coping may be affected by contextual cues like cultural values or depend on individual differences like gender.

Making people nervous at the first sight, genetic testing adherence, however, is not a widely-shared cultural value. To persuade individuals to take action for this action should require a different perspective than the immediate strategy of increasing self-esteem with a salient cultural value in the environment. Preserving the features of a proximal defense mechanism surely seems sensible to encourage genetic test undertake compared to a symbolic defense mechanism because genetic testing necessitates a more direct understanding rather than engaging in symbolic values. Furthermore, genetic testing requires long-term actions unlike the instant value adherence of distal coping. The results of genetic testing are not end-

states like getting rid of the health risk, but are the beginning of a series of preventive actions directed to possible causes. In other words, people should be aware of the underlying reason for their anxiety to be able to cope with it directly unlike the general subliminal death awareness attributed to distal coping.

In sum, people can deal with existential anxiety in different ways. The question, then, is whether the coping route to be taken can be predicted in any given situation. Specifically, we expected that the likelihood of using proximal coping strategies should increase when people are in abstract mind-set, but decrease when they are in a concrete mind-set. We tested whether the mind-sets of individuals can make a difference on their coping strategies.

Matching of Defensive Mechanisms with Construal Levels

Construal level theory (Liberman & Trope, 2008) differentiates mind-sets in perception of events and objects. An abstract mind-set is characterized with superordinate goals, desirability, and global processing; whereas a concrete mind-set is identified with subordinate goals, feasibility, and local processing (McCrea et al., 2012). On a related note, Förster (2012) summarized the predetermined moderators of global processing as promotion focus, distal events, high power, novelty seeking, obstacles, and low level of anxiety. He, nonetheless, pointed out that local processing is related to prevention focus, proximal events, low power, similarity, lack of obstacles, and high levels of anxiety. To give an example referring to genetic testing, a person in abstract mind-set can approach to genetic test as an opportunity to eliminate obstacles for a healthy life; but a person in concrete mind-set may prefer to avoid the list of risks he/she will learn or find procedures (e.g., selection of hospital, receiving feedback) difficult.

It is obvious for genetic testing adherence that one should believe in the necessity of genetic testing. The person should also feel sufficient amount of control to take action. If a person envisions genetic testing as a disclosure of risks with no present cure, dislikes novelty

because he feels powerless and anxious in general, this person should be more likely to engage in symbolic activities to cope with mortality salience. Therefore, we envisioned that the distinction between mind-sets can be reflected onto coping mechanisms. An abstract mind-set should trigger proximal coping that one directly deals with death anxiety by taking preventive actions. A concrete mind-set should encourage symbolic coping that a person distract himself/herself from related worries and does not feel obliged to fight with any risk.

Consumption as a Symbolic Defensive Mechanism Example

When individuals are in a concrete mind-set and requested to think of their genetic risks for cancer, they should be more likely to engage in symbolic behaviors in response to the subtle awareness of death. Cancer may immediately prompt death thoughts and reveal feelings of anxiety and fear. As a response, individuals may get motivated to suppress this discomfort via distal coping. Vail et al. (2012) explained how most terror management theory studies demonstrated the effects of existential fears like evaluative biases (e.g., stereotyping), defensive distortions, prejudice, protection of one's cultural beliefs and self-esteem in an aggressive way. These examples portray the dark side of existential fears.

Similarly, hedonic consumption can be used as a symbolic coping strategy in situations where consumption is regarded as a cultural value. As Keinan (1987) posited, when people get stressed, they fail to consider all possible options. Moreover, stress has been shown to interfere with one's capability to consider salient features of the situation and to think deliberately about the pros and cons of alternative options (Janis & Mann, 1977). Thus, death anxiety associated with cancer screening may inhibit people's cognitive capacity. Decreased consideration for the benefits of genetic testing should direct people toward symbolic coping mechanisms as in the case of symbolic consumption.

Elimination of Genetic Testing Barriers with Mind-Set Manipulation

The purpose of this study is to examine the ways of changing genetic testing intentions as a function of construal levels. Based on past research, we reasoned that being in an abstract mind-set can foster intentions to pursue genetic testing. This is because individuals should easily notice and integrate the long term benefits of genetic testing in an abstract mind-set, which is associated with low levels of anxiety and high levels of efficacy.

There is not much research on the effects of construal levels in domains where people are likely to receive potentially self-threatening information. In an exceptional study, Cavanaugh and Sweeny (2012) showed that self-construal abstraction can protect people from anxiety for the results of a distressing issue when the issue is self-relevant and immediate. Applied to genetic testing, this finding implies that construal levels can be effective on genetic testing specific anxiety. So, changes in anxiety levels are likely to alternate genetic test perceptions and intentions. Individuals who think abstractly should be less stressful for receiving information about their cancer risk; whereas individuals who think concretely should find dealing with such risks more burdensome.

The abstraction concept is explained with action identification perspective (Vallacher & Wegner, 1987, 1989). Thomas and Tsai (2012) showed that abstract perspective reduces the feeling of difficulty caused by task complexity and task anxiety. Thus, decreased difficulty should aid in handling of genetic testing uncertainty and the following death anxiety. The subsequent requirements should also seem easier considering the many implementations. When conducting the test and performing the suggested actions seem less difficult, genetic testing should be perceived more doable because individuals feel more efficacious. Existence of a risk-action link has been shown to increase understanding and response efficacy of dieting in the case of colon cancer (Cameron et al., 2012). As pointed out by Bandura and Cervone (1983), people spend more effort for tasks that they feel they can accomplish and associate positive outcomes with, whereas they avoid from tasks that they feel less efficacious

about and have negative outcome expectations. Consequently, abstraction is expected to decrease perceived difficulty and increase efficacy. On the other hand, concrete mind-set lacks most of the features explained above for abstract mind-set.

Specification of Anxiety Level

For a critical behavior to be conducted, it is necessary that an individual should not be too overwhelmed with anxiety because such an arousal can be perceived as a sign of panic or incompetence (Abraham et al., 2008). On the contrary, if arousal due to anxiety is interpreted as natural during critical decision making processes, it may contribute in the form of excitement and commitment. Thus, reinterpretation of stressful actions with regard to arousal is potential for boosting self efficacy. In his integrated social cognition model, Conner (2010) included emotional reaction as a predictor of intention in an attempt to uncover the background for a behavior to be realized. Consequently, in this study specialized anxiety is included to analyze its positive effect on intention in spite of its negative valence.

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The Current Study

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This study aims to analyze whether certain obstacles to genetic testing (i.e., anxiety, difficulty and, low efficacy) can be buffered with an abstract mind-set. Individuals in the concrete mind-set, however, are expected to demonstrate weaker intentions to take genetic testing, presumably because their short-term focus will not help reduce cancer-related death anxiety as much as those in the abstract mind-set. Thus, we tested the following hypotheses in the present study.

H1: People in the abstract mind-set will have more favorable attitudes and intentions toward taking genetic testing compared to people in the concrete mind-set.

H2: People in the abstract mind-set will feel less anxious while considering to take genetic testing compared to people in the concrete mind-set.

H3: People in the abstract mind-set will perceive less difficulty for the conduct of genetic test compared to people in the concrete mind-set.

H4: People in the abstract mind-set will feel more efficacious to take genetic test compared to people in the concrete mind-set.

A distal coping, which is mostly unrelated to genetic testing utilization, is expected to go along with concrete mind-set, but it can eventually relieve people when applied. The resulting relief is also anticipated to offer a more convenient mood for genetic testing evaluation because of reduced anxiety. Therefore, this study asserts that if evaluation does not follow information exposure for individuals in the concrete mind-set and if these individuals are allowed to reduce their anxiety level even with symbolic mechanisms, they are expected to demonstrate more favorable attitudes and stronger intention for getting genetic test.

H5a: In the concrete mind-set condition, participants who engage in immediate distal coping will feel less anxious after they receive genetic testing information compared to people who do not engage in immediate distal coping.

H5b: In the concrete mind-set condition, participants who engage in immediate distal coping will favor and intend to take genetic test compared to the participants who do not engage in immediate distal coping.

Likewise, the desired effect of relief due to distal coping is anticipated to be valid for people in the abstract mind-set. These people are already supposed to have lower levels of anxiety about having genetic test and an additional relaxing effect of an immediate distal coping will further lessen this anxiety.

H6a: In the abstract mind-set condition, people who engage in immediate distal coping will feel less anxiety after they receive genetic testing information compared to the people who do not engage in immediate distal coping.

H6b: In the abstract mind-set condition, people who engage in immediate distal coping will favor and intend to take genetic test compared to the people who do not engage in immediate distal coping.

Besides testing these hypotheses, we also attempted to identify individual differences related to attitudes and intentions for taking genetic test. Awareness for genetic testing substantially varies within and across cultures (e.g., Amin & Al-Wadaani, 2012; Botoseneanu et al., 2011). Gender, belief in genetic factors (Kasparian et al, 2008), and the main perceptions offered by health belief model – benefits, barriers and severity- (Wang et al., 2007) are accepted as prominent variables. Additionally, baseline affective states as in the cases of distress (van Oostrom, 2007) and anxiety (Dinc & Terzioglu, 2006) can be plausible variables to trace different genetic testing behaviors. To give an example, Case et al. (2005) indicated baseline anxiety level as an information avoidance predictor compared to information seeking behavior. Interestingly, Cappela et al. (2005) demonstrated that inferred genetic susceptibility to smoking can be boosted with priming if individuals find the given information believable and have a family history of smoking. Thus, individual variables can be influential in the genetic testing consideration from awareness to actual behavior.

Based on past research, we identified a set of individual differences that can affect genetic testing intentions negatively: Trait anxiety, neuroticism, cancer anxiety, death anxiety, fatalism, health information avoidance, and external locus of control. While higher levels of these variables may be associated with more negative attitudes and intentions for getting genetic test, belief in genetic determination, openness to experience, conscientiousness, consideration for future consequences, health motivation, and internal locus of control may be positively associated with more favorable attitudes and intentions. The relevance of these variables was not examined sufficiently before. Thus, we measured these variables in the present study.

Method

Participants

One hundred four students (49 males) from the Koç University participant pool participated in this study in exchange for course credit (M_{age} = 21.52).

Design and Procedure

This study was designed to reveal the subsequent influence of construal levels and additional effects of distal coping as well as influence of individual differences. First participants were informed about genetic testing, how it can prevent some cancer types, and asked whether they have taken genetic testing to trigger thinking and anxiety (if possible) about cancer and genetic testing. Then the sample was split into two for construal level manipulations, and each group again separated into two for the experience of symbolic consumption or distraction task. A 2 (Construal Levels: Abstract vs. concrete) by 2 (Symbolic Consumption Consideration or not) ANOVA test was conducted on the dependent variables of interest: Attitudes and intentions toward getting genetic testing. The relationships involving individual differences were examined with decision tree analyses.

Construal-level manipulation. To induce different mind-sets, we used a manipulation that was not directly related to genetic testing in terms of its content (Förster et al., 2004). Specifically, to induce a concrete mind-set, we had the participants focus on ways of doing things with short-term consideration. To induce an abstract mind-set, we had them think about reasons of doing things with long-term consideration.

Specifically, participants in the concrete mind-set were asked to think about creative ways of greeting someone. They were also requested to generate solutions that would be prospectively implemented the following day. To preserve the same rationale throughout the idea generation process, participants were asked to begin each of their responses with the phrase "Tomorrow, I will greet someone by _____".

Participants in the abstract mind-set were asked to think of creative reasons why people should greet someone. They were further directed to generate solutions that would be prospectively implemented a year from that day. To ensure the influence of manipulation, participants were asked to begin each of their responses with the phrase "A year from now, I will greet someone because _____".

Distal coping manipulation (Symbolic consumption consideration). In an attempt to reduce genetic testing anxiety indirectly, groups in this condition were requested to think of a hedonic product (e.g., the latest Apple product or their dream destination) and instructed to report their likelihood of buying and feelings if owned.

After the mind-set manipulation and experience of either symbolic consumption task or distraction task –consisting of general knowledge questions-, participants were informed about genetic testing. And then, they were asked for their attitudes and intentions toward getting genetic test as well as how much efficacy and difficulty they perceived to take genetic testing. To see how their general and current anxiety levels changed following genetic testing consideration, participants were requested to report their cancer anxiety and state anxiety. Finally, they completed additional measures of individual differences and demographics.

Measures

Because of the novelty of the issue, participants were first presented with a brief description of genetic testing prior to measurement of attitudes and intentions (Bosompra et al., 2000; see Appendix A). Then, we asked whether or not they have ever heard of genetic testing. The questions below followed the basic definition.

Attitudes toward getting genetic test*:* Attitudes toward taking genetic test were measured with three questions asking participants to rate having genetic testing along 5-point rating scales (Braithwaite, 2002; see Appendix A; $\alpha = .90$).

Intention to get genetic testing: Next, participants expressed their intentions with the following two questions (Bosompra et al., 2001; see Appendix A).: "If genetic testing for cancer risks were available to you now, would you be likely to get it the next 6 months?" and "What is your likelihood to take a genetic test for a disease that is genetically transmitted and curable?" Responses to these two questions were strongly correlated ($r = .66$).

Perceived difficulty of genetic testing: Perceived difficulty associated with getting genetic testing was measured with a single question: ''In general, how difficult do you think it would be for you to have the genetic test?'' (Braithwaite, 2002; see Appendix A).

Perceived efficacy for genetic testing: The level of efficacy related to genetic testing behavior was examined with the adapted efficacy item of Champion's Health Belief Model: "I can easily get genetic testing done" (Gözüm & Aydın, 2004; see Appendix A).

Cancer anxiety: Anxiety level specific to cancer was measured with two items adapted from McCaul et al. (1996): "How worried you are about getting breast cancer?", "How frightened are you when you think about cancer?"(see Appendix B; $r = .54$).

State anxiety: State anxiety was measured with three items selected from Bieling and colleagues' (1998) state-trait anxiety inventory. Items of this measure (e.g., "I feel very tense right now") were rated along agreement scales (see Appendix B; $\alpha = .91$).

Trait anxiety: The Turkish adaptation of Penn State Worry Questionnaire by Boysan et al. (2008) was used to detect the level of anxiety in general (see Appendix C; $\alpha = .88$). Sample items used for the current study included the following: " "I get more anxious when I am under pressure", "I have been an anxious person throughout my life."

Fatalism: Wallston et al.'s (1999) God Locus of Health Control Scale was used for the adaptation of fatalism items specific to health (see Appendix D; $\alpha = .86$). Sample items used in this study included the following: "No matter what I do, if I am going to get a serious illness, I will get it.", "I will die, when it is meant to be."

Neuroticism: An adopted version of neuroticism subscale from Big Five Inventory (BFI) was used (Benet-Martínez & John, 1998; see Appendix E; α = .74). Sample items from this scale include the following: "I am someone who can remain calm in tense situations", "I am someone who can get nervous easily."

Openness to experience: Eight items from the openness to experience subscale of the BFI were adapted for the purposes of the study (see Appendix F; α = .83). Sample items included the following: "I am someone who is original", "... who comes up with new ideas", "... who is inventive."

Conscientiousness: Conscientious was measured with # items adapted from the BFI (see Appendix G; α = .74). Sample items for this scale included the following: "… who makes plans, follows through with them.", "…who tends to be lazy".

Future time orientation: The 12-item Consideration of Future Consequences scale (Strathman et al., 1994) was used to assess differences in time orientation, with items such as "I consider how things might be in the future, and try to influence those things with my day to day behavior" and "I only act to satisfy immediate concerns, figuring the future will take care of itself." (see Appendix G; α = .63)

Health motivation: A three-items health motivation scale was constructed in line with the recommendations of the Health Belief Model (Champion, 1984; Appendix H; α = .63). "I have the recommended yearly physical exams in addition to visits related to illness" was a sample item from this measure.

Health information avoidance: The level of motivation for acquiring information about individual health status was measured with four items adapted from Melnyk and Shepperd's (2012) Information Avoidance Scale (Appendix I; α = .94), which included items such as "I would rather not know everything about my health" and "When it comes to my health, sometimes ignorance is bliss."

Genetic determination: Participants' perceptions of the extent to which predestination and behaviors are determined by genes were measured with two items adapted from O'Neill et al.'s (2010) Causal Attributions Scale (see Appendix J; $r = .63$). Sample items included the following: "One's faith is dependent on his/her genes which are the features inherited from parents" and "I believe that most of the behaviors are inherited genetically."

Death anxiety: The anxiety specific to death was measured with Templer's (1970) Death Anxiety Scale, which included items such as "I am very much afraid to die" and "It makes me nervous when people talk about death."(see Appendix K; $\alpha = .88$)

Locus of control: Items from the Multidimensional Health Locus of Control (MHLOC) Scale (Wallston et al., 1978; see Appendix L) were used to determine the source of power people attribute regarding their health. The scale covers internal, powerful others (external), and chance dimensions. "If I get sick, it is my own behaviors which determine how soon I get well again" is an example item for the internal locus of control dimension of the scale. "Health professionals keep me healthy" is an example item for the powerful others dimension. Finally, "Luck plays a big part in determining how soon I will recover from an illness" is an example for the chance dimension ($\alpha = .84, .78, .80$ respectively).

Results

Descriptive statistics for the key variables are presented in Table 1. Data revealed that attitudes and intentions toward genetic testing are very favorable. Perceptions of efficacy for taking genetic tests were also very favorable. These results suggest that participants could take the test when given opportunity. Cancer anxiety, however, was low presumably because university students are too young to be worried about cancer. State anxiety, which could increase as a function of being reminded of cancer, was again low.

Table 1. *Means (and Standard Deviations) for Key Variables*

Genetic Test Intention	4.31 (0.79)
Genetic Test Attitudes	4.24 (0.75)
Efficacy for Taking Genetic Test	3.59 (0.91)
Difficulty of Taking Genetic Test	3.25 (0.87)
Cancer Anxiety	3.09 (0.88)
State Anxiety	2.42 (0.94)

Note: ($N = 104$). All of the variables were measured along 5-point rating scales.

The mindset manipulation (abstract vs. concrete) did not make a significant difference on attitudes (F (1, 103) = 0.004, *ns, see Table 2*) or intentions (F (1, 103) = 0.92, *ns, see Table 3*). Symbolic consumption manipulation similarly did not produce any difference for attitudes (F (1, 103) = 0.04, *ns*) or intentions (F (1, 103) = 0.02, *ns*). Furthermore, these manipulations did not interact with each other to alter the attitudes (F (1, 103) = 0.01 *ns*) or the intentions (F (1, 103) = 0.17, *ns*). Thus, none of the hypothesized relationships is supported by the current sample. These results may be due to the low level of cancer anxiety reported by the sample: There was not much room to decrease anxiety levels further with manipulations.

Table 2

ANOVA Table for Genetic Testing Attitudes by Construal Level Manipulation and Symbolic Consumption Manipulation

	df	F	$\eta 2$	p
Construal Level	1	.00	.00	.95
Symbolic Consumption	1	.04	.00	.85
Construal Level X Symbolic Consumption	1	.01	.00	.93
Error	100			

Note: N = 104. Dependent Variable here is the 'Genetic Testing Attitudes'.

Table 3

ANOVA Table for Genetic Testing Intentions by Construal Level Manipulation and Symbolic Consumption Manipulation

	df	*F*	η2	*p*
Construal Level	1	.92	.01	.34
Symbolic Consumption	1	.02	.00	.89
Construal Level X Symbolic Consumption	1	.17	.00	.68
Error	100			

Note: N = 104. Dependent Variable here is the 'Genetic Testing Intention'.

Individual Differences on Genetic Test Acceptance

Part of the difficulty in detecting an effect of the independent variables was due to the range restriction problem in the dependent variables. The distributions for measures of attitudes and intentions were skewed (see Table 1). Thus, there was little room for the situational moderators to make a difference. Nonetheless, there was some variance still and I wanted to examine whether this variability could be explained by individual differences in tendencies such as health motivation, conscientiousness, and neuroticism. Descriptive statistics associated with these attributes are reported in Table 4. Table 5 shows the correlations of these attributes with attitudes and intentions toward getting genetic testing.

Table 4

Means (and Standard Deviations) for Individual Variables

Conscientiousness	3.49 (0.60)
Death Anxiety	3.04 (1.12)
Fatalism	2.80 (1.08)
Future Time Orientation	3.93 (0.71)
Genetic Determination	3.07 (0.93)
Health Motivation	3.47 (0.75)
Health Information Avoidance	2.37 (1.04)
HLOC - Chance	2.43 (0.69)
HLOC – Internal	3.55 (0.62)
HLOC – Others	3.03 (0.67)
Neuroticism	3.10 (0.63)
Openness to New Experiences	4.13 (0.61)
Trait Anxiety	3.03 (0.60)

Note: N = 104.

Table 5

Correlations among Key Variables and Individual Differences

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.GT Intentions															
2.GT Attitudes	.66**														
3.Cancer Anxiety	.26**	.26**													
4.Neuroticism	.08	.01	.09												
5.Openness to New Exp.	.13	-.01	.03	-.14											
6.Conscientiousness	-.08	.03	.10	-.05	-.05										
7.Fatalism	.11	-.03	.15	.06	.02	.28**									
8.Future Orientation	.06	.11	.20*	-.07	.05	.33**	-.04								
9.Health Motivation	.23*	.30**	.35**	.02	.11	.42**	.16	.28**							
10.Health Inf. Avoidance	-.46**	-.54**	-.15	-.17	.02	.07	.08	-.11	-.23*						
11.Genetic Determination	.13	.16	.17	.05	-.00	-.06	.05	-.02	.18	-.07					
12.Death Anxiety	.14	.15	.49**	.22*	-.04	.08	.05	.20*	.31**	-.00	.12				
13.Internal HLOC	.10	.16	.13	-.14	.19	.01	-.30**	.34**	.06	-.17	.12	.14			
14.External HLOC	.21*	.14	.29**	.10	-.13	.03	.20*	-.05	.26**	-.17	.31**	.29**	-.02		
15.Chance HLOC	-.04	-.02	.13	.14	-.04	-.05	.50**	-.21*	.11	.05	.12	-.09	-.42**	.31**	
16. State Anxiety	.00	.03	.31**	.39**	.07	-.13	-.04	-.10	-.03	-.01	.03	.22*	-.16	.11	.19

*p <.05 **p <.01

As can be seen from the table, anxiety specific to cancer was significantly related to genetic testing attitudes as well as intentions. Besides anxiety, health motivation and health information avoidance were also significantly related to attitudes and intentions toward getting a genetic test. Thus, one should care his/her health and not be reluctant to learn information about his/her health even the information is negative so that this person can depict positive attitudes and high intentions to take genetic test. Conscientiousness and future time orientation were not related to attitudes and intentions significantly.

Predictors of Genetic Test Intention: Decision Tree Analyses

Complex relationships such as critical cut points or interactions were likely to exist among these attributes. Therefore, I used decision trees to explore the relationship between the aforementioned attributes and genetic testing intentions. In the first decision tree, cancer anxiety and health information motivation were used to predict intentions to get a genetic test (see Figure 1). As can be seen, when health information avoidance exceeded a moderate level, intention to take genetic testing became less favorable (Node 2) compared to lower levels of health information avoidance (Node 1). For low-to-moderate levels of health information avoidance, genetic testing intentions were stronger (Node 4) and these intentions were even stronger at higher levels of cancer anxiety (Node 8). When health information avoidance was very low, genetic testing intentions were very favorable (Node 3). Moreover, high levels of cancer anxiety along with low levels of health information avoidance seemed to boost intentions to almost perfect favorability (Node 6). This decision tree analysis suggests that anxiety specific to cancer may be a motivating factor for genetic test uptake when health information avoidance is low. The model fit was satisfactory for this simple tree ($R^2 = .27$).

Adding attitudes and family history into the model made significant differences. The decision tree in Figure 2 shows that attitudes toward getting genetic testing were the foremost predictor of intentions. People who had favorable attitudes toward genetic testing naturally

reported stronger intentions (Node 2). In addition, having a history of cancer in the family

brought about even more favorable intentions to get tested (Node 8). On the other hand, if

genetic testing attitudes were not very favorable, health information avoidance became

critical: Intentions were weak at higher levels of health information avoidance (Node 4).

Variance explained by this tree was higher than the first tree ($R^2 = 0.49$).

Decision tree analyses explained the decision process better than multiple regression

analyses of the same variables ($R^2 = 0.25$ for the first model and $R^2 = 0.46$ for the second

model). The trees better predicted the relationships of the variables and showed cut-off points.

Supplementary analyses

Because the manipulations used in this study did not work as expected, I conducted

additional analyses to examine the effects of the manipulations on genetic testing intentions,

controlling for cancer anxiety. Table 5 shows the results of this analysis. As can be seen,

controlling for cancer anxiety did not bring about a significant difference on the effects of the

manipulations on intentions.

Table 5

*ANCOVA Table for Genetic Testing Intentions by Construal Level Manipulation and
Symbolic Consumption Manipulation with Cancer Anxiety*

	df	*F*	η2	*p*
Cancer Anxiety	1	8.10	.08	.00*
Construal Level	1	2.17	.02	.14
Symbolic Consumption	1	.00	.00	.95
Construal Level X Symbolic Consumption	1	.04	.00	.84
Error	99			

Note: * $p < .05$. $N = 104$.

Next, I reanalyzed the data for individuals whose cancer anxiety was moderate or high (i.e., rated 3 or more on a 5-point scale). The results in Table 6 again showed that the manipulations did not have any effects on intentions to get genetic testing.

Table 6

ANOVA Table for Genetic Testing Intentions by Construal Level and Symbolic Consumption Manipulations for Participants at Moderate and Higher Levels of Cancer Anxiety

	df	*F*	η2	*p*
Construal Level	1	0.28	.00	.60
Symbolic Consumption	1	1.34	.02	.25
Construal Level X Symbolic Consumption	1	0.02	.00	.88
Error	63			

Note: N = 67.

Discussion

The goal of this research was to examine some of the situational moderators and individual difference correlates of intentions to take genetic testing in the future. In particular, the mindset manipulation was intended to bolster intentions to get tested by reducing anxiety associated with the idea of cancer. Intentions were already very positive, and there was little or no anxiety around the construct—hence, there was little room for this manipulation to make a difference and it did not. Previous research had shown that anxiety was one the most important barriers for getting a genetic test, and several strategies to cope with this anxiety were either developed or implicated. I anticipated that acquiring an abstract mind-set could lead to direct coping of genetic testing anxiety when compared to having concrete mind-set because being in an abstract mind-set decreases anxiety and allows to see the linkages

between different actions, for example getting tested and preventing cancer. I also expected that symbolic actions (i.e., hedonic consumption) could also motivate individuals towards getting genetic testing because these actions relax individuals in general and might encourage them to engage in otherwise distressing activities, as in the case of getting genetic testing. Such a coping could be an example of distal coping. Neither the construal level nor the symbolic consumption manipulation, however, made a difference on attitudes and intentions in the present study.

Such results may be due to several reasons. Most importantly, the data were collected from university students: Genetic testing issue might not have been very relevant for this sample given their young age. As the present data revealed, cancer anxiety levels were low for this sample; thus, there was not much anxiety to reduce. Hence, it is necessary to retest these hypothoses with relatively older samples, as cancer anxiety generally increases with age.

Even though the manipulations used in this study did not bring about a breakthrough in our understanding of decision making underlying genetic testing, our analysis of individual difference attributes revealed some interesting findings worth studying in the future. The first decision tree revealed that health information avoidance was negatively associated with intentions to get a genetic test: when health information avoidance was high, genetic testing intentions were not favorable. Only low health information avoidance brought high intentions; and these intentions further increased for those who had high levels of cancer anxiety. Consequently, this tree showed that at least moderate levels of cancer anxiety is needed to develop strong intentions to get tested. What is more challenging, however, will be to develop strategies to deal with people's inclination to avoid health-related information, or resistance to learn more about their health prospects.

The second tree examined the relevance of genetic testing attitudes and family history for cancer in addition to health information avoidance. For this model, genetic testing

attitudes was the first determinant to differentiate the intentions to get the test: favorable genetic testing attitudes were observed for the group having high intentions for getting the test. For those having favorable attitudes, experience of cancer in the family further bolstered intentions to get tested.

The results of the current study and the findings of the recent studies demonstrated that individuals can avoid learning information about their health and such an avoidance can decrease intentions for getting genetic test. In a current review about genetic testing, Sweeny et al. (2014) pointed out that people who are reward sensitive and need certainty are more interested in genetic testing. Thus, if genetic testing information is given in a reward oriented and uncertainty decreasing way, the communication is more likely to be successful and individuals may refrain less from receiving potentially threateing health-related news. Individuals may also use some strategies to decrease the negative implications of getting health information. Sweeny and Cavanaugh (2010) presented three strategies to decrease the anxiety of dealing with health information: minimazing objective, emotional, and cognitive consequences of a bad health outcome, reappraisal of good and bad health outcomes, and emotion regulation. Therefore, these strategies can be encouraged in genetic test communications so that the individuals can get less avoidant of their health information.

Although the effect of family history is inconsistent considering previous studies (for a review see Sweeny et al., 2014), the current study demonstrated a positive association between having family history and high genetic testing intentions. I believe that reminding such a reality coming from a family member in genetic testing communications can also be beneficial in fighting with reluctance for getting genetic testing.
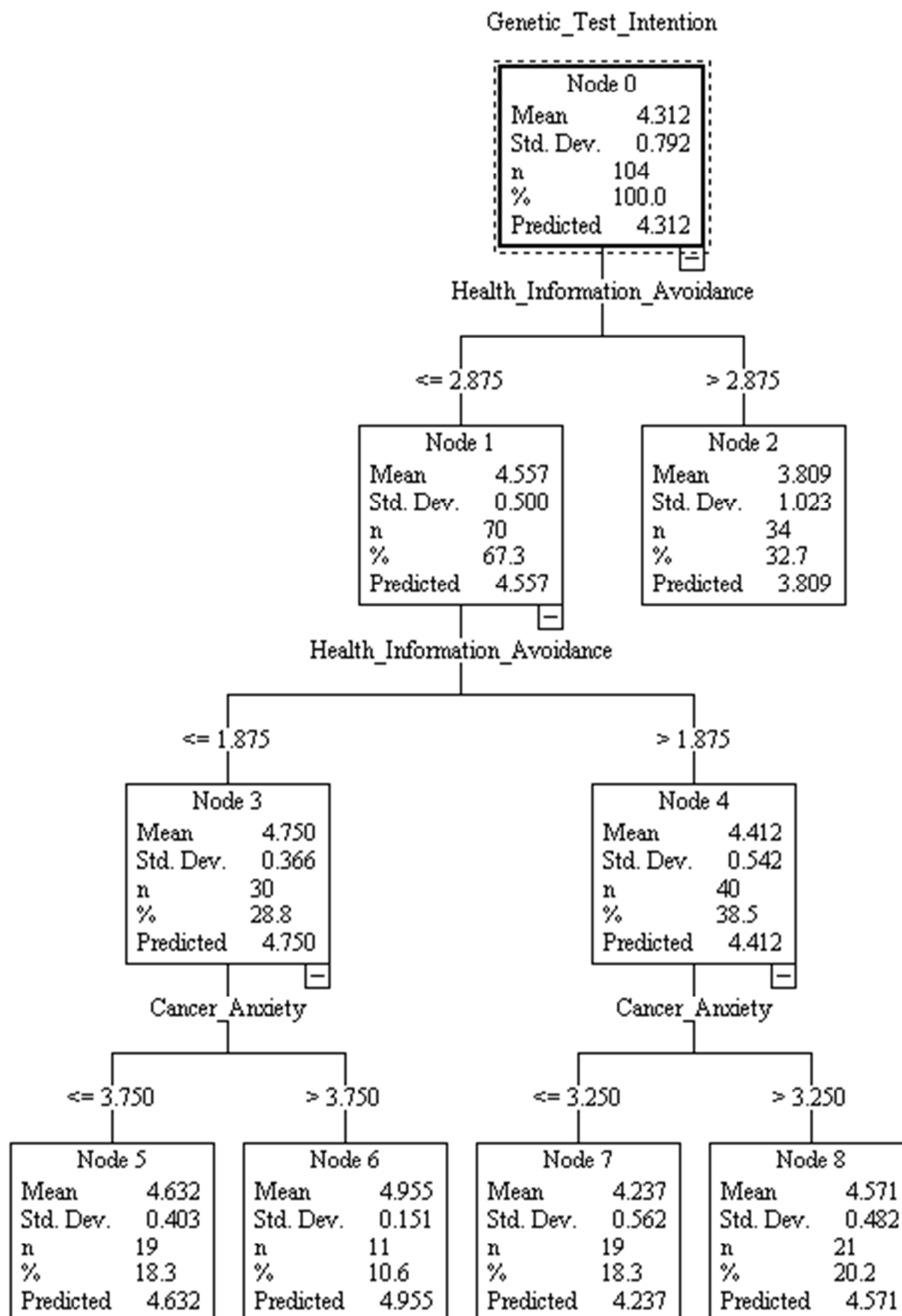
Figure 1-Decision Tree

Genetic_Test_Intention

Node 0

Mean	4.312
Std. Dev.	0.792
n	104
%	100.0
Predicted	4.312

Health_Information_Avoidance

<= 2.875 | > 2.875

Node 1

Mean	4.557
Std. Dev.	0.500
n	70
%	67.3
Predicted	4.557

Node 2

Mean	3.809
Std. Dev.	1.023
n	34
%	32.7
Predicted	3.809

Health_Information_Avoidance

<= 1.875 | > 1.875

Node 3

Mean	4.750
Std. Dev.	0.366
n	30
%	28.8
Predicted	4.750

Node 4

Mean	4.412
Std. Dev.	0.542
n	40
%	38.5
Predicted	4.412

Cancer_Anxiety

<= 3.750 | > 3.750

Cancer_Anxiety

<= 3.250 | > 3.250

Node 5

Mean	4.632
Std. Dev.	0.403
n	19
%	18.3
Predicted	4.632

Node 6

Mean	4.955
Std. Dev.	0.151
n	11
%	10.6
Predicted	4.955

Node 7

Mean	4.237
Std. Dev.	0.562
n	19
%	18.3
Predicted	4.237

Node 8

Mean	4.571
Std. Dev.	0.482
n	21
%	20.2
Predicted	4.571

Figure 2 – Decision Tree

Genetic_Test_Intention

Node 0
Mean	4.312
Std. Dev.	0.792
n	104
%	100.0
Predicted	4.312

Genetic_Test_Attitudes

<= 4.167   > 4.167

Node 1
Mean	3.850
Std. Dev.	0.870
n	50
%	48.1
Predicted	3.850

Node 2
Mean	4.741
Std. Dev.	0.360
n	54
%	51.9
Predicted	4.741

Health_Information_Avoidance

<= 2.750   > 2.750

Genetic_Test_Attitudes

<= 4.500   > 4.500

Node 3
Mean	4.241
Std. Dev.	0.544
n	27
%	26.0
Predicted	4.241

Node 4
Mean	3.391
Std. Dev.	0.965
n	23
%	22.1
Predicted	3.391

Node 5
Mean	4.458
Std. Dev.	0.396
n	12
%	11.5
Predicted	4.458

Node 6
Mean	4.821
Std. Dev.	0.309
n	42
%	40.4
Predicted	4.821

Family_History

No   Yes

Node 7
Mean	4.706
Std. Dev.	0.398
n	17
%	16.3
Predicted	4.706

Node 8
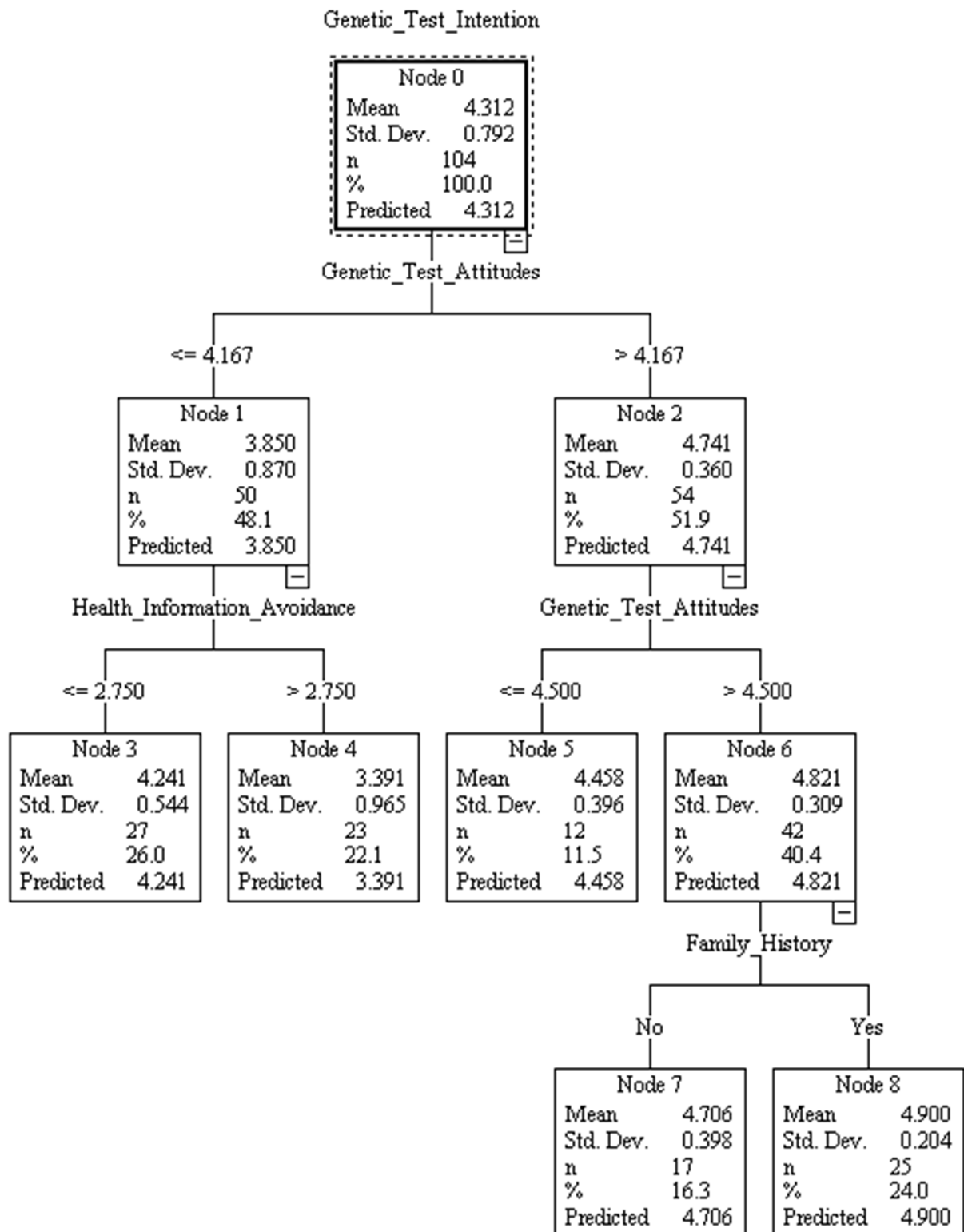|	
Mean	4.900
Std. Dev.	0.204
n	25
%	24.0
Predicted	4.900

References

Abraham, C., Conner, M., Jones, F., & O'Connor, D. (2008). *Health Psychology Topics in Applied Psychology*: Hodder Education.

Amin, T. T., Al-Wadaani, H. A., Al-Quaimi, M. M., Aldairi, N. A., Alkhateeb, J. M., & Al-Jaafari, A. A. L. (2012). Saudi women's interest in breast cancer gene testing: Possible influence of awareness, perceived risk and socio-demographic factors. *Asian Pacific Journal of Cancer Prevention*, 13(8), 3879-3887.

Arndt, J., Greenberg, J., & Cook, A. (2002). Mortality salience and the spreading activation of worldview-relevant constructs: Exploring the cognitive architecture of terror management. *Journal of Experimental Psychology: General*, 131(3), 307-324.

Arndt, J., Solomon, S., Kasser, T., & Sheldon, K. M. (2004). The urge to splurge: A terror management account of materialism and consumer behavior. *Journal of Consumer Psychology,* 14(3), 198-212.

Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology*, *45*(5), 1017-1028.

Benet-Martínez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology*, *75*(3), 729-750.

Bieling, P. J., Antony, M. M., & Swinson, R. P. (1998). The State--Trait Anxiety Inventory, Trait version: structure and content re-examined. *Behaviour Research and Therapy*, 36(7–8), 777-788.

Bosompra, K., Ashikaga, T., Flynn, B. S., Worden, J. K., & Solomon, L. J. (2001). Psychosocial factors associated with the public's willingness to pay for genetic testing for cancer risk: A structural equations model. *Health Education Research*, 16(2), 157-172.

Bosompra, K., Flynn, B. S., Ashikaga, T., Rairikar, C. J., Worden, J. K., & Solomon, L. J. (2000). Likelihood of undergoing genetic testing for cancer risk: A population-based study. *Preventive Medicine*, 30(2), 155-166.

Botoseneanu, A., Alexander, J. A., & Banaszak-Holl, J. (2011). To test or not to test? The role of attitudes, knowledge, and religious involvement among US adults on intent-to-obtain adult genetic testing. *Health Education & Behavior*, 38(6), 617-628.

Boysan, M., Keskin, S., & Besiroglu, L. (2008). Penn state endişe ölçeği Türkçe formunun hiyerarşik faktör yapısı, geçerlik ve güvenilirliği. *Klinik Psikofarmakoloji Bülteni*, 18(3), 174-182.

Braithwaite, D. (2002). Intention to participate in predictive genetic testing for hereditary cancer: The role of attitude toward uncertainty. *Psychology & Health*, *17*(6), 761.

Brosius, H. B., & Bathelt, A. (1994). The utility of exemplars in persuasive communications. *Communication Research*. 21(1), 48-78.

Cameron, L. D., Marteau, T. M., Brown, P. M., Klein, W. M. P., & Sherman, K. A. (2012). Communication strategies for enhancing understanding of the behavioral implications of genetic and biomarker tests for disease risk: The role of coherence. *Journal of Behavioral Medicine*, 35(3), 286-298.

Cappella, J. N., Lerman, C., Romantan, A., & Baruh, L. (2005). News about genetics and smoking - Priming, family smoking history, and news story believability on inferences of genetic susceptibility to tobacco addiction. *Communication Research*, 32(4), 478-502.

Case, D. O., Andrews, J. E., Johnson, J. D., & Allard, S. L. (2005). Avoiding versus seeking: the relationship of information seeking to avoidance, blunting, coping, dissonance, and related concepts. *Journal of the Medical Library Association*, 93(3), 353-362.

Cavanaugh, A. G., & Sweeny, K. M. (2012). Hanging in the balance: The role of self-construal abstractness in navigating self-relevant uncertainty. *Personality and Social Psychology Bulletin*, 38(4), 520-527.

Champion, L. V. (1984). Instrument development for the health belief model constructs. *Advances in Nursing Science*, *6,* 73-85.

Conner, M. (2010). Cognitive Determinants of Health Behavior. In A. Steptoe (Ed.), *Handbook of Behavioral Medicine Methods and Applications* (pp. 19-30). Springer.

Dinc, L., & Terzioglu, F. (2006). The psychological impact of genetic testing on parents. *Journal of Clinical Nursing*, 15(1), 45-51.

Facione, N. (2002). Perceived risk of breast cancer: Influence of heuristic thinking. *Cancer Practice*, *10*(5), 256-262.

Förster, J. (2012). GLOMOsys : The how and why of global and local processing. *Current Directions in Psychological Science*, 21(1), 15-19.

Förster, J., Friedman, R. S., & Liberman, N. (2004). Temporal construal effects on abstract and concrete thinking: Consequences for insight and creative cognition. *Journal of Personality and Social Psychology*, *87*(2), 177-189.

Gerbes, L., & Jungst, D. (1994). Reducing mortality from colorectal cancer by screening for fecal occult blood. *Zeitschrift Fur Gastroenterologie,* 32(10), 603-606.

Globocan (2010). Globocan 2008 fast stats. Retrieved from: http://globocan.iarc.fr/factsheets/populations/factsheet.asp?uno=900

Globocan (2014). Globocan 2012 cancer fact sheets. Retrieved from: http://globocan.iarc.fr/Pages/fact_sheets_cancer.aspx

Gozum, S., & Aydin, I. (2004). Validation evidence for Turkish adaptation of Champion's health belief model scales. *Cancer Nursing*, 27(6), 491-498.

Greiner, K. A., James, A. S., Born, W., Hall, S., Engelman, K. K., Okuyemi, K. S., & Ahluwalia, J. S. (2005). Predictors of fecal occult blood test (FOBT) completion among low-income adults. *Preventive Medicine*, 41(2), 676-684.

Hartmann, L. C., Schaid, D. J., Woods, J. E., Crotty, T. P., Myers, J. L., Arnold, P. G., . . . Jenkins, R. B. (1999). Efficacy of bilateral prophylactic mastectomy in women with a family history of breast cancer. *New England Journal of Medicine*, 340(2), 77-84.

Janis, I. L., & Mann, L. (1977). *Decision making: A psychological analysis of conflict, choice, and commitment*. New York, NY, US: Free Press.

Kasparian, N. A., Butow, P. N., Meiser, B., & Mann, G. J. (2008). High- and average-risk individuals' beliefs about, and perceptions of, malignant melanoma: An Australian perspective. *Psycho-Oncology*, 17(3), 270-279.

Keinan, G. (1987). Decision making under stress: Scanning of alternatives under controllable and uncontrollable threats. *Journal of Personality and Social Psychology*, *52*(3), 639-644.

Liberman, N., & Trope, Y. (2008). The psychology of transcending the here and now. *Science*, 322, 1201–1205.

McCaul, K. D., Schroeder, D. M., & Reid, P. A. (1996). Breast cancer worry and screening: Some prospective data. *Health Psychology*, *15*(6), 430-433.

McCrea, S. M., Frank W., & Andrea L. M. (2012). Construal level mind-sets moderate self- and social stereotyping, *Journal of Personality and Social Psychology*, 102 (1), 51-68.

McQueen, A., Vernon, S. W., Meissner, H. I., & Rakowski, W. (2008). Risk perceptions and worry about cancer: Does gender make a difference?. *Journal of Health Communication*, 13(1), 56-79.

Melnyk, D., & Shepperd, J. (2012). Avoiding risk information about breast cancer. *Annals of Behavioral Medicine*, 44(2), 216-224.

O'Neill, S. C., McBride, C. M., Alford, S. H., & Kaphingst, K. A. (2010). Preferences for genetic and behavioral health information: The impact of risk factors and disease attributions. *Annals of Behavioral Medicine, 40*(2), 127-137.

Smith, R. A., Cokkinides, V., & Brawley, O. W. (2008). Cancer screening in the United States, 2008: A review of current American Cancer Society Guidelines and Cancer Screening Issues. *CA: A Cancer Journal for Clinicians*, 58(3), 161-179.

Solomon, S., Greenberg, J.,Pyszczynski, T. (1991). A terror management theory of social behavior: The psychological functions of self-esteem and cultural worldviews. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 24, pp. 93-159). New York, NY Academic Press.

Strathman, A., Gleicher, F., Boninger, D. S., & Edwards, C. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology*, 66(4), 742-752.

Sweeny, K., & Cavanaugh, A. G. (2012). Waiting is the hardest part: A model of uncertainty navigation in the context of health news. *Health Psychology Review*, *6*(2), 147-164.

Sweeny, K., Ghane, A., Legg, A. M., Huynh, H. P., & Andrews, S. E. (2014). Predictors of Genetic Testing Decisions: A Systematic Review and Critique of the Literature. *Journal of Genetic Counseling*, *23*(3), 263-288.

Templer, D. I. (1970). The construction and validation of a death anxiety scale. *Journal of General Psychology*, 82, 165-177.

Thomas, C. R., & Gadbois, S. A. (2007). Academic self-handicapping: The role of self-concept clarity and students' learning strategies. *British Journal of Educational Psychology*, 77, 101-119.

Thomas, M., & Tsai, C. I. (2012). Psychological distance and subjective experience: How distancing reduces the feeling of difficulty. *Journal of Consumer Research*, 39(2), 324-340.

Vail, K. E., Juhl, J., Arndt, J., Vess, M., Routledge, C., & Rutjens, B. T. (2012). When death is good for life: Considering the positive trajectories of terror management. *Personality and Social Psychology Review*, 16(4), 303-329.

Vallacher, R. R., & Wegner, D. M. (1987). What do people think they're doing? Action identification and human behavior. *Psychological Review*, 94, 3–15.

Vallacher, R. R., & Wegner, D. M. (1989). Levels of personal agency: Individual variation in action identification. *Journal of Personality and Social Psychology*, 57,660–671.

van Oostrom, I., Meijers-Heijboer, H., Duivenvoorden, H. J., Brocker-Vriends, A., van Asperen, C. J., Sijmons, R. H., . . . Tibben, A. (2007). Prognostic factors for hereditary cancer distress six months after BRCA1/2 or HNPCC genetic susceptibility testing. *European Journal of Cancer*, 43(1), 71-77.

Wallston, K. A., Wallston, B. S. & DeVellis, R. (1978) Development of the multidimensional health locus of control (MHLC) scales. *Health Education Monographs*, 6, 160-170.

Wallston, K.A., Malcarne, V., Flores, L., Hansdottir, I., Smith, C., Stein, M., . . . Clements, P. (1999). Does God Determine Your Health? The God Locus of Health Control Scale. *Cognitive Therapy and Research, 23*(2), 131-142.

Wang, C., Gonzalez, R., Janz, N. K., Milliron, K. J., & Merajver, S. D. (2007). The role of cognitive appraisal and worry in BRCA1/2 testing decisions among a clinic population. *Psychology & Health*, 22(6), 719-736.

Weitzman, E. R., Zapka, J., Estabrook, B., & Goins, K. V. (2001). Risk and reluctance: Understanding impediments to colorectal cancer screening. *Preventive Medicine,* 32(6), 502-513.

WHO (2013). 10 facts about cancer. Retrieved from:

http://www.who.int/features/factfiles/cancer/en/index.html

Appendix A

Adopted Genetic Test Definition and Awareness Item

(Bosompra et al., 2000)

Günümüzde kan veya diğer vücut dokularının numunesinin analizi yolu ile hücrelerin genetik yapıları incelenebiliyor. Bu incelemeler bireyin ileride kanser ve diğer kalıtsal, ırsi, yani ebeveynlerden çocuklarına geçen hastalıklara yakalanma ihtimalleri hakkında bilgi verebiliyor. Bu tür testlere genetik test adı verilmektedir.

Genetik testler sonucunda kişilere özel önlemler ve erken tanı yöntemleri önerilmektedir. Örneğin akciğer kanseri riski yüksek olan kişiye sigarayı bırakmasının önerilmesi veya meme kanseri yüksek olan bir kadında mamografi yaptırma sıklığının artırılması gibi.

Sizin de kendi genetic yatkınlıklarınızı öğrenmeniz ve şimdiden önlem almanız mümkün!

1. Siz bugünden önce bu tür genetik testler hakkında birşey duymuş muydunuz?

   o Evet

   o Hayır

Genetic Testing Attitudes Items

(Braithwaite, 2002)

Genetik test yaptırmak…

1. Çok gereksizdir	1	2	3	4	5	Çok gereklidir
2. Çok kötü olur	1	2	3	4	5	Çok iyi olur
3. Hiç yararlı değildir	1	2	3	4	5	Çok yararlıdır

Intention for Genetic Testing Item (Bosompra et al., 2001)

1. Eğer kanser olma ihtimalinizi belirlemek için genetik test yaptırma olanağı size sunulsaydı, önümüzdeki altı ay içinde bu testi yaptırma ihtimaliniz sizce ne kadar olurdu?
   o Çok düşük
   o Düşük
   o Orta Düzeyde
   o Yüksek
   o Çok yüksek

2. Tedavisi olan ve aileden geçen yani kalıtsal bir hastalık için genetik test yaptırabilmenin mümkün olduğunu düşünün. Bu testi yaptırma ihtimaliniz sizce ne kadardır?
   o Çok düşük
   o Düşük
   o Orta Düzeyde
   o Yüksek
   o Çok yüksek

Adapted Perceived Difficulty of Genetic Testing Item (Braithwaite, 2002)

1. Sizce genetic test yaptırmak genel anlamda ne kadar zor olurdu?
   o Çok zor
   o Biraz zor
   o Orta Düzeyde
   o Kolay
   o Çok kolay

Adapted Perceived Efficacy for Genetic Testing Item (Gözüm & Aydın, 2004)

1. Genetik testi rahatlıkla yaptırabilirim.
   o Hiç katılmıyorum
   o Katılmıyorum
   o Ne katılıyorum ne katılmıyorum
   o Katılıyorum
   o Tamamen katılıyorum

Appendix B

Cancer Anxiety Items

(McCaul et al., 1996)

1. Bazı insanlar kanser olmaktan hiç endişelenmezken bazıları kanser olmaktan çok

    endişelenir. Siz ne kadar endişeleniyorsunuz?

2. Peki kanser hakkında düşünmek sizi ne kadar rahatsız eder?

3. İleride kanser olma ihtimaliniz sizce ne kadardır?

State Anxiety Items

(Bieling et al., 1998)

4. Şu anda kendimi kaygılı hissediyorum.

5. Şu anda gerginim.

6. Şu anda gayet sakinim.

Appendix C

Penn State Worry Questionnaire

(Boysan et al., 2008)

1. Her şeye yetişebilecek kadar zamanım olmasa bile bunun için endişelenmem. (R)

2. Endişelerim beni bunaltır.

3. Bir şeyler hakkında endişelenmeye eğilimli değilim. (R)

4. Pek çok durum beni endişelendirir.

5. Bir şeyler hakkında endişelenmemem gerektiğini biliyorum; ancak kendime engel olamıyorum.

6. Baskı altında olduğumda çok fazla endişelenirim.

7. Her zaman bir şeyler hakkında endişeleniyorum.

8. Endişe veren düşünceleri aklımdan uzaklaştırmayı kolay bulurum. (R)

9. Bir işi bitirir bitirmez, yapmak zorunda olduğum her şey için endişelenmeye başlarım.

10. Hiçbir şey için asla endişelenmem. (R)

11. Bir sorun hakkında yapabileceğim daha fazla bir şey olmadığında o konu hakkında daha fazla endişelenmem. (R)

12. Hayatım boyunca endişeli birisi oldum.

13. Birden bir şeylere endişelenmekte olduğumu fark ederim.

14. Bir kere endişelenmeye başladığımda durduramam.

15. Her zaman endişelenirim.

16. Tümüyle yapılıp bitirilinceye kadar planladığım işler hakkında endişelenmeye devam ederim.

Appendix D

Fatalism Scale

(Wallston et al., 1999)

1. Eğer birinin ciddi bir hastalığa yakalanacağı varsa, ne yapsa kar etmez; eninde sonunda yakalanır.

2. Ne kadar yaşayacağımız yazılmıştır.

3. Ne zaman öleceğim yazıldıysa o zaman öleceğim.

Appendix E

Adapted Neuroticism Scale

(Benet-Martinez & John, 1998)

1. Depresifimdir.

2. Stresle kolay başa çıkabilirim. (R)

3. Telaşlıyımdır.

4. Kaygılıyımdır.

5. Ruh halim dengelidir. (R)

6. Bazen karamsar olabilirim.

7. Ruh halim çevremden çabuk etkilenir.

8. Baskı altındayken sakin kalabilirim. (R)

9. Çabuk sinirlenirim.

Appendix F

Adapted Openness to Experience Scale

(Benet-Martinez & John, 1998)

1. Original fikirler üretirim.

2. Ilgi alanlarım çok çeşitlidir.

3. Hayal gücüm kuvvetlidir.

4. Yaratıcıyımdır.

5. Değişimi severim.

6. Farklı şeyler denemeyi severim.

7. Fikir jimnastiği yapmayı severim.

8. Yeni yerler keşfetmeyi severim.

Adapted Conscientiousness Scale

(Benet-Martinez & John, 1998)

1. İşimi savsaklamam.

2. Biraz dikkatsiz olabilirim. (R)

3. Üzerime aldığım işi bitiririm

4. Dağınığımdır. (R)

5. Düzenliyimdir

6. Genel itibariyle tembel bir yapım vardır. (R)

7. Elimdeki işi bitirene kadar rahat etmem.

8. Yaptığım planlara sadık kalırım.

9. Tutumluyumdur.

Appendix G

Adapted Consideration of Future Consequences Scale

(Strathman et al., 1994)

1. Bir karar verirken, o kararın beni ileride nasıl etkileyeceğini düşünürüm.

2. Gelecekte hayatımın nasıl olacağını sürekli planlarım.

3. Gelecekte ne olacağını bilemeyiz, bu yüzden uzun vadeli plan yapmaya gerek yoktur.

Appendix H

Adapted Health Motivation Scale

(Champion, 1984)

1. Sağlıklı kalmak benim için çok önemlidir.

2. Sağlıklı kalabilmek için yaşam tarzımı değiştirmeye hazırım.

3. Hasta olmasam bile düzenli sağlık kontrolü yaptırırım.

Appendix I

Adapted Health Information Avoidance Scale

(Melnyk & Shepperd, 2012)

1. Sağlığım ile ilgili herşeyi bilmek istemezdim.

2. Beni rahatsız edecek olsa bile, sağlığımla ilgili herşeyi bilmek isterdim.

3. Sağlığım söz konusu olduğunda, herşeyi bilmesem daha iyi.

4. Sağlığımla ilgili herşeyi bilmek istiyorum.

Appendix J

Adapted Genetic Determination Items

(O'Neill et al., 2010)

1. Bir kişinin yazgısı genlerine yani ebeveynlerinden geçen kalıtsal özelliklere dayanır.

2. Bireylerin davranışlarının bir çoğunun kökeninin kalıtsal olduğuna inanıyorum.

Appendix K

Adapted Death Anxiety Scale

(Templer, 1970)

1. Ölmekten korkarım.

2. İnsanların ölüm hakkında konuşmaları beni rahatsız eder.

3. Ölüm hakkında düşünmek beni rahatsız eder.

Appendix L

Adapted Health Locus of Control Scale

(Wallston et al., 1978)

1. Eğer hastalanırsam, ne kadar çabuk iyileşeceğimi kendi davranışlarım belirler.

2. Sağlıklı kalıp kalmayacağım benim kontrolümdedir.

3. Hastalandığımda suçlanması gereken benim.

4. Benim sağlığımı etkileyen en ana etmen benim kendimi korumak için ne yaptığımdır.

5. Kendime iyi bakarsam, hastalıkların önüne geçebilirim.

6. Doğru tedbirleri alırsam, sağlıklı kalabilirim.

7. Hastalandığımda ne kadar çabuk iyileşeceğim doktorlara bağlıdır.

8. Yakın çevrem olmasa hastalandığımda iyileşmem çok zor olurdu.

9. Hastalandığımda ailemin bana nasıl baktığı ne kadar çabuk iyileşeceğimi belirler.

10. Beni sağlıklı tutan, doktorlardır.

11. Sağlıklı kalabilmem için, ailemin ve arkadaşlarımın herşeyin yolunda gitmesini sağlaması gerekir.

12. Sağlığımı bozan pek çok şeyin başıma kötü şans eseri geldiğini düşünüyorum.

13. Eğer hastalanırsam, ne kadar çabuk iyileşeceğim şansıma bağlı.

14. Sağlığımın iyi olması bahtımın iyi olması sonucudur.

15. Bozulacağı varsa ne olursa olsun sağlığım bozulur.

16. Kaderim değişmeyeceğinden, ne yaparsam yapayım hasta olacaksam olurum.