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# AN INTERVENTION TO INCREASE ELECTRICITY SAVINGS IN THE CONTEXT OF ENERGY CONSUMPTION: IMPLEMENTATION INTENTION AND TRANSTHEORETICAL MODEL

**BY**

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*To all the courageous activists around the world*

*& to the inspiring memory of Mahsa Amini…*

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# ÖZET

**AKDENİZ, Deniz. Energy tüketimi bağlamında elektrik tüketimini azaltmaya yönelik bir müdahale: Niyet aşılama ve Transteoretik Değişim Modeli. Başkent Üniversitesi, Sosyal Bilimler Enstitüsü, Sosyal Psikoloji Tezli Yüksek Lisans Programı, 2023.**

İklim değişikliği ve küresel ısınmanın neden olduğu zarar uzun süredir araştırılan ve bilinen bir sorundur. Elektrik, en çok kullanılan ve ihtiyaç duyulan enerji türü olarak tanımlanmaktadır ve Türkiye'de elektrik tüketiminin emisyonlara önemli ölçüde katkıda bulunduğu aynı zamanda küresel ısınmanın neden olduğu zararlara olan katkısı bilinmektedir. Niyet aşılama ve değişime hazır olma, davranış değişiminde etkili bulunan modellerdir ve çevre dostu davranışlarla ilgili literatürde çeşitli uygulamalara sahiptirler. Bu nedenle, niyet aşılama ve değişime hazır olmanın katılımcıların elektrik tasarrufuna yönelik tutum, motivasyon ve davranışları üzerindeki etkisi 2 (deney ve kontrol) x 2 (ön x son) x 2 (tasarruf yapan x tasarruf yapmayan) karma desen tekrarlı ölçümlü ANOVA ile incelenmiştir. Araştırmanın örneklemini 18 yaşından büyük 92 kişi oluşturmakta ve ön ve son ölçümler arasında iki haftalık bir zaman aralığı bulunmaktadır. Çalışmanın sonuçlarına göre, beklenilenin aksine niyet aşılama yalnızca dışsal motivasyon değişime hazır olma ise eko-yönetim davranışı, öz-belirlenen motivasyon, içe yansıtılmış motivasyon üzerinde anlamlı bir etki yaratmıştır. Daha önemlisi, niyet aşılama ve değişime hazır olmanın ikna davranışı üzerinde ortak etkisi olduğu bulunmuştur. Bu durum, niyet aşılama modelinin değişime hazır olma ile birlikte ele alındığında tasarruf yapan bireyler üzerinde daha etkisi olduğunu göstermektedir. İleriki çalışmalarda, niyet aşılama modeli uygulanmadan önce bireylerin değişim aşamaları modelinde eylem aşamasına gelmeleri sağlanabilir.

**Anahtar Kelimeler:** niyet aşılama, değişime hazır olma, elektrik tasarrufu, çevre yanlısı davranış

# ABSTRACT

**AKDENİZ, Deniz. An intervention to increase electricity savings in the context of energy consumption: Implementation intention and Transtheoretical Model. Başkent University, Institute of Social Sciences, Master's in Social Psychology with Thesis, 2023.**

The damage caused by climate change and global warming has been a long-studied and known issue. Electricity is defined to be the most used and needed type of energy and it is known that electricity consumption contributes significantly to emissions in Turkey therefore the occurred damages of the global warming. Implementation intention and readiness for change are models that are found to be effective in behavior change, and they have various applications in the literature on pro-environmental behaviors. Thus, the effect of implementation intention and readiness to change on participants' attitudes, motivations and behaviors toward electricity-saving were examined through 2 (experiment vs. control) x 2 (baseline x follow-up) x 2 (action x contemplation) mixed model repeated measures ANOVA. The sample of this research consists of 92 individuals who are above 18 years of age and there was a two-week time interval between pre and post measures. The results indicated that contrary to expected, implementation intention only influenced external motivation and readiness to change only influenced behavior, eco-management behavior, motivation, self-determined motivation, introjected motivation. The dominant effect of readiness to change was not unexpected. More profoundly, it was found that implementation intention and readiness to change had a significant interaction on persuasion behavior. This result showed the effectiveness of implementation intention paired with readiness to change and the effect of implementation intention increases when implemented to individuals in action stage of change together with the importance of individuals' stage of change in terms of effectiveness of implementation intention. For future studies and practical implications, before providing implementation intention intervention, individuals' transition to action stage from contemplation stage can be procured.

**Keywords:** implementation intention, transtheoretical model, readiness to change, electricity saving, pro-environmental behavior

# TABLE OF CONTENT

# LIST OF TABLES

**Page**

# LIST OF FIGURES

**Page**

# 1. INTRODUCTION

"Once we start to act, hope is everywhere."

(Greta Thunberg, 2019, 10:11)

## 1.1. The Problem

The world is facing many global environmental problems due to climate change, including the depletion of resources and the loss of biodiversity (Klöckner, 2013). According to the National Environmental Information Centers (2021), in January 2021, land and ocean surface temperatures were 0.80°C above the 20th-century average and it was the hottest January in the past 142 years. Additionally, according to the 2020 report of the World Meteorological Organization [WMO], greenhouse gas emissions continue to increase, and sea levels are rising due to the melting of glaciers in Antarctica and Greenland. In 2020, over 80% of ocean areas experienced at least one strong heatwave, the annual sea ice extent in the Arctic hit a record low, strong rains and floods occurred in Asia and Africa, a record number of storms hit the coast of North America, severe droughts were reported in many parts of South America, 2020 was recorded as the third warmest year, and most land areas experienced higher temperatures than average. Moreover, it has been reported that greenhouse gas emissions reached their highest level in 2019. Although there was a decrease in greenhouse gases in 2020, this decrease is debated as a temporary reduction due to the measures taken against the Coronavirus pandemic (WMO, 2020). Based on all of these, it can be argued that global warming and climate change have significant impacts on the environment and these impacts are increasing.

## 1.2. Global Warming

According to the World Wildlife Fund [WWF] (n.d.), global warming is a process that refers to long-term increases in climate, mostly caused by greenhouse gas emissions in the atmosphere. However, global warming does not only make the climate hotter than usual. It also leads to rising sea levels, forest fires, floods and landslides, habitat destruction such as coral reefs, the extinction of plant and animal species, increased air pollution, allergies, asthma, and the spread of infectious diseases (Centers for Disease Control and Prevention, 2021; European Commission, n.d.; WWF, n.d). In addition, it is noted that with increasing global warming, injury, illness, and death rates may also increase due to heat waves, floods,

storms, and droughts (Venkataramanan & Smitha, 2011). In short, global warming as a result of climate change poses a serious threat to all living things (WWF, n.d.).

The primary cause underlying climate change is carbon dioxide (CO2) emissions (National Aeronautics and Space Administration, n.d.). CO2 is a type of greenhouse gas and burning fossil fuels results in the release of CO2 into the atmosphere (Intergovernmental Panel on Climate Change, n.d.). It is reported that in 2018, CO2 emissions increased by 1.7%, reaching a record high (International Energy Agency, 2019). In 2019, while countries such as Germany, Japan, France, and Mexico, which have developed economies, are reported to have significantly reduced carbon emissions, Turkey ranks 20th in the world in terms of CO2 emissions (Organization for Economic Cooperation and Development, 2019). After the two-year pandemic period, energy-related CO2 carbon emissions increased by 0.9% globally reaching a new high level (International Energy Agency, 2022). Although Turkey has separated its economic growth from air emissions, waste production, and electricity consumption since 2008, its high dependence on fossil fuels hinders its efforts toward environmental sustainability (Organization for Economic Cooperation and Development, 2019). In the current era of global economic growth, commitments to reducing global environmental disasters, especially for developing economies such as Turkey, pose a major dilemma (Saint Akadiri et al., 2019). Turkey's energy demand is increasing day by day, and this demand is being met especially by fossil fuels such as coal (Saint Akadiri et al., 2019). It is reported that in 2018, Turkey's electricity consumption increased by 303.3 million kilowatts per hour (Ministry of Energy and Natural Resources, 2019). In addition, it is reported that 37.3% of Turkey's energy production is obtained from coal (Ministry of Energy and Natural Resources, 2019). Furthermore, it is known that electricity consumption contributes significantly to emissions in Turkey (Saint Akadiri et al., 2019).

The damage caused by climate change and global warming to the environment, societies, and humans is increasing every day (United Nations Environment Programme, n.d.). However, due to various reasons such as increasing population and developing technologies, the energy needs of countries are constantly on the rise (Saint Akadiri et al., 2019). Although developed countries have started to meet a significant portion of their energy needs from renewable energy sources, developing or underdeveloped countries like Turkey still continue to depend on fossil fuels (International Energy Agency, 2021; Ministry of Energy and Natural Resources, 2019). Unfortunately, reducing the carbon emissions of certain countries alone is not enough to eliminate or reduce the effects of global warming. Electricity is the

most needed and consumed form of energy (U.S. Energy Information Administration, 2020) and a significant portion of the damage caused to the environment by countries that rely on fossil fuels for their electricity needs comes from electricity consumption (Energy, 2019; Organisation for Economic Co-operation and Development, 2019; Saint Akadiri et al., 2019).

Restrictions imposed within the scope of the COVID-19 pandemic have led to significant changes in individuals' energy consumption habits and amounts (Bielecki et al., 2021). Although the remote work model was initiated by certain companies prior to the COVID-19 pandemic to increase their employees' productivity, efficiency, and ability to establish a work-life balance more easily (Bailyn et al., 2001), it has become a globally implemented work model with the COVID-19 pandemic (Abu-Rayash & Dincer, 2020; Bahmanyar et al., 2020). It is reported that the number of people working from home in the United States increased from 0.8 million in 2015 to 4.7 million at the beginning of 2020 (Courtney, n.d.). By the end of August, it is known that 42% of the total workforce in the United States were working from home as part of COVID-19 measures (Wong, 2020). It is observed that the remote work model, which has been widely implemented worldwide within the scope of the COVID-19 pandemic, has led to a significant increase in household electricity consumption (Lou et al., 2021). According to the results of a global study, the main reason for the decrease in the total amount of electricity consumption during COVID-19 restrictions is the decrease in the commercial sector (Krarti & Aldubyan, 2021). In addition, according to a study conducted during the COVID-19 pandemic, the electricity consumption of homes in New York City increased by 15-24% compared to the pre-pandemic period (Li et al., 2021). Additionally, a study examining country-based electricity consumption in the European Economic Area during COVID-19 restrictions found that while individual electricity consumption in homes in Sweden decreased compared to the pre-pandemic period on workdays, electricity consumption levels on holiday days with curfews were higher than before (Bahmanyar et al., 2020). Similarly, according to a study by Bulut (2020) examining electricity consumption in Turkey during the COVID-19 pandemic, the increase in electricity demand, which had been continuously rising in 2018 and 2019, started to decrease with the first COVID-19 case on March 11, 2020, and the accompanying precautionary measures. By the time April and May came around, electricity consumption had decreased by 15.5% and 16.4%, respectively, compared to 2019. However, with the relaxation of COVID-19 measures in June 2020, an increase in electricity consumption is observed. Additionally,

while the electricity consumption in agricultural irrigation, lighting, trade, and industry areas decreased compared to March 2019, an increase in electricity consumption in residences is reported (Bulut, 2020). Furthermore, with the effects of the COVID-19 pandemic being mitigated with the availability of vaccines and the easing of restrictions, individuals beginning to return to their pre-pandemic lifestyles and habits led to a 4.6% increase in global energy demand, surpassing pre-pandemic levels (International Energy Agency, 2021).

In addition, Russia's ongoing full-scale military invasion of Ukraine together with the unfolding humanitarian crisis has led to a drastic increase in carbon dioxide and other greenhouse gas emissions into the atmosphere. 7 months of the war results in at least 100 million tCO2e which is approximately equal to the month's total greenhouse gas emission of a whole country such as the Netherlands (Initiative on GHG Accounting of War, 2022). Fossil fuels play a crucial role in military operations as they are used in tanks, armored vehicles, aircraft, logistics vehicles, and other military vehicles. These fuels are used during various stages of military operations, including mobilization, movements, and even standby time. For example, some old tanks and armored fighting vehicles do not have auxiliary power units to recharge their batteries, and their main engines must run periodically to recharge them. In addition to military vehicles and trucks, fuel is also used by civilian vehicles involved in war-related activities such as emergency services, medical vehicles, and evacuation movements. Fuel storage facilities are often targeted in missile or drone attacks to disrupt military operations. Tractors are also used to recover abandoned or damaged vehicles. Using large amounts of fuel results in significant greenhouse gas emissions and contributes to the impact of climate change during war (Initiative on GHG Accounting of War, 2022).

One of the most important factors in preventing climate change is replacing fossil fuels with renewable energy sources. However, individual actions are equally important along with technological developments and creating national and international policies (Klöckner, 2013). Borgstede and colleagues' (2013) study investigates the attitudes of the public toward climate change and how psychological factors influence their reported energy-efficient behaviors. The research compares the results of two opinion polls conducted in 2005 and 2010. It is found that in 2010, there were fewer respondents who supported the use of new technologies to reduce emissions compared to 2005. However, there is an increase in the number of people who believed that lifestyle changes were necessary to combat climate change. Further analysis of the 2010 survey reveals that respondents who had pro-

environmental attitudes towards global warming were in favor of using renewable energy technologies more and engaging in more energy-efficient behaviors (Borgstede et al., 2013).

### 1.3. Energy Consumption

Energy consumption refers to the amount of energy consumed by countries, companies, or individuals (Collins Dictionary, n.d.). In this context, energy sources are divided into two main categories: (1) Renewable energy sources and (2) Non-renewable energy sources. Renewable energy sources include solar energy, wind energy, geothermal energy, hydroelectric energy, ocean thermal energy, and biomass energy. Non-renewable energy sources are petroleum, hydrocarbon, natural gas, coal, and nuclear energy. Renewable energy sources, also known as clean energy, are energy sources obtained from natural resources that are continuously renewable and have low carbon emissions. On the other hand, non-renewable energy sources are also called dirty energy, are limited in nature, and have high carbon emissions (Carbon Brief, 2017; Eltamaly & Mohamed, 2018; Natural Resources Defense Council, 2018).

In the 1970s, the first wave of policies on energy conservation and increasing the energy efficiency of housing began after the oil crisis. By the 2010s, the same agenda caused a new wave through global warming and fossil fuel consumption (Brounen et al., 2012). According to Hertwich (2005), individuals' behaviors within their homes are important indicators of total energy consumption and CO2 emissions. Additionally, it is known that 72% of worldwide CO2 emissions are due to household consumption (Hertwich & Peters, 2009) and that energy consumption is responsible for 40% of greenhouse gas emissions (Delmas et al., 2013). Despite the negative effects of high energy consumption on the world and the environment, electricity consumption continues to increase (Baddeley, 2011; Hinrichs & Kleinbach, 2011). In addition, high energy consumption not only has negative effects on the environment and ecosystems, but it is also debated that it has significant economic impacts (Steg & Vlek, 2009). Due to the decrease in fossil fuel and oil resources, prices are rising and this has a negative impact on both individuals' purchasing power and the countries' economy (Brounen et al., 2012). In Turkey, where postponed economic activity has strengthened after the pandemic, energy demand has picked up, shaking off the stagnation observed in 2020. In the first three quarters of the year, natural gas demand grew by approximately one-third compared to the same period of the previous year. Similar trends are observed in demand for petroleum products. Total domestic sales of petroleum products for the January-July 2021 period increased by 7.1% compared to the same period of the

previous year, reaching 16.7 million tons as COVID-19 restrictions eased. This value is higher than the 16.3 million tons of sales in the same period of 2019, which can be considered as the pre-pandemic baseline (Turkish Industrial Development Bank, 2021).

Turkey's energy needs are increasing day by day, and this need is mainly met with fossil fuels such as coal combustion (Saint Akadiri et al., 2019). In addition, 83% of Turkey's energy production comes from fossil fuels. In 2018, it is reported that Turkey's electricity consumption increased by 303.3 million kilowatts per hour (Ministry of Energy And Natural Resources, 2019). In 2020, Turkey's total electricity consumption was 273.55 terawatt hours, and carbon emissions were 366.11 metric tons. Also, more than 25% of energy production in Turkey in the same year was provided from oil, more than 20% from coal, more than 20% from natural gas, and nearly 10% from renewable energy sources such as wind and solar (International Energy Agency, 2021).

Addedly, it is stated that changes in sea levels, temperature and severity and frequency of extreme events can affect the quantity of energy production, delivery and consumption (Akhmat et al., 2014). A study conducted by Al-mulali and colleagues (2013) in the Middle-East North Africa (MENA) countries, reveals a positive relationship between urbanization, energy consumption, and CO2 emission. Further, a study aimed at examining the relationship between environmental pollutants and energy consumption shows that in terms of increasing environmental pollutants, energy consumption has an important driver role (Akhmat et al., 2014). Similarly, another study conducted by Mudakkar and colleagues (2013) focuses on investigating the cause-and-effect relationship between energy consumption and greenhouse gas emission across the seven largest regions in the world. The research findings indicate that energy consumption is the causal factor for greenhouse gas emissions, but the reverse relationship does not hold true.

### 1.4. Electricity Consumption

Electricity is the most used and needed type of energy, and it is used in many areas such as lighting, heating, cooling systems, and electronic devices (U.S. Energy Information Administration, 2020.).

It is known that electricity consumption contributes significantly to emissions in Turkey (Saint Akadiri et al., 2019). Although the restrictions imposed under the coronavirus pandemic have led to a significant decrease in total energy consumption in Turkey and worldwide, both the amount of electricity consumed by households has increased during this

period due to the transition to remote work (Bulut, 2020; Li et al., 2021; Lou et al., 2021), and electricity consumption has exceeded pre-pandemic levels after the lifting of the restrictions (Bulut, 2020; International Energy Agency, 2021).

In Turkey, the total electricity consumption in the first 9 months of 2021 was 219.9 TWh. This consumption amount is 10.1% higher than the value of 199.8 TWh for the same period in 2020. When compared to the period of 2017-2019 instead of 2020, there is an average annual growth rate of 8.9% in the first 9 months of 2021 (Turkish Industrial Development Bank, 2021). Further, it is reported that there was a 6.6% increase in residential electricity consumption compared to the previous year during the coronavirus restrictions in 2020 (Electricity Engineers Association, 2021).

There are many factors that affect individuals' electricity consumption. In a study conducted in the Netherlands with 300,000 participants, a positive relationship is found between electricity consumption and the number of people and children living in the house (Brounen et al., 2012). However, according to Jones and Lomas' (2015) study, electricity saving rates increase when the number of people living in the house reaches three or more. Additionally, it is discussed that low-income levels can prevent unnecessary use of resources, but at the same time, high prices can be a barrier to the use of renewable energy sources such as solar panels (Macovei, 2015). Furthermore, it is found that individuals' sensitivity to climate change is effective in energy conservation (Abrahamse et al., 2005). Additionally, it is observed that individuals' attitudes and perceived behavioral control did not have an effect on energy consumption but were related to energy conservation within an intervention program (Abrahamse & Steg, 2009). Moreover, in Brandon and Lewis' (1999) study, it is stated that participants who were not included in an intervention program (control group) did not have an effect on energy conservation, whereas participants who were included in the intervention program (experimental group) showed a significant change in energy conservation.

### 1.5. Pro-environmental Behavior

Pro-environmental behaviors can be defined as the behaviors that individuals show in order to protect the environment and minimize harm to the environment (Krajhanzl, 2010; Steg & Vlek, 2009). Examples of pro-environmental behavior include recycling, reducing energy consumption, using bicycles, preferring public transportation instead of individual cars, and consuming organic foods (European Commission, 2012; Hopper& Nielson, 1991;

Krajhanzl, 2010; Sparks & Shepherd, 1992; Thogersen, 1996; Vining & Ebreo, 1992). Various researchers argue that creating and sustaining pro-environmental behaviors are challenging processes because the consequences of these behaviors are not immediately observable and are mostly behavior patterns that do not directly affect individuals (Leary et al., 2011). Research shows that individuals believe the consequences of global warming will not directly affect them because they believe that these consequences are uncertain and will not occur in the near future (Clement et al., 2014; Gifford, 2011). However, Geller (2002) suggests that behavior change can be effectively created when the behavior to be changed is carefully selected, the factors affecting the behavior are identified, appropriate intervention models are applied, and the effects of these interventions are systematically examined. In addition, according to De Young (1993), detailed information about the process, regular feedback, and a supportive social environment are necessary for an intervention program on creating pro-environmental behavior to be effective and sustainable. Furthermore, the study by Staats and colleagues (2004) shows that intervention programs on pro-environmental behavior within families are effective when regular feedback and social support are provided.

Interdisciplinary studies are crucial to overcoming all these global environmental issues (Klöckner, 2013). Many environmental problems, such as climate change and global warming, arise as a result of social and individual behaviors (Lehman & Geller, 2004). Therefore, it is thought that by changing these behaviors, the negative impacts on the environment can be eliminated (Steg & Vlek, 2009).

Hannerz (1992) stated in his theory, which is based on anthropology, that there is a mutual relationship between cultures and individuals who constitute those cultures, meaning that individuals shape culture and are also shaped by culture. Additionally, Bronfenbrenner (1979, 1986) argued in his Ecological Systems Theory that individuals' development cannot be separated from their environment and that individuals are influenced by the environment in which they live, while also influencing that environment. In addition to these, according to the Multilayered Culture Model, there is a mutual relationship between individuals, groups, communities, countries, and global cultures. In top-down socialization processes, individuals internalize the common values of their society, and these values begin to be represented in their selves. In bottom-up aggregation processes, the values represented in individuals' selves, in turn, influence culture (Erez & Gati, 2004). Based on all of these, it is

predicted that behavior changes made at the individual level will have an impact at the societal level as well.

Based on all these, examining electricity consumption under the scope of energy consumption was preferred for this thesis. Addedly, since it is suggested that a significant portion of the damage and destruction to the environment is caused by human and societal behaviors (Lehman & Geller, 2004) and behavioral changes in both individual and societal level are important, increasing individuals' electricity-saving was targeted under the scope of this present thesis.

## 1.6. Theoretical Framework

### 1.6.1. Implementation intention

Since the 1980s, various models and theories have been created to understand and increase individuals' pro-environmental behaviors (Klöckner, 2013). One of these models, called implementation intentions (Gollwitzer, 1999), is essentially a model created to achieve the realization of established goals, i.e., the transformation of behavior, based on the predetermined identification of certain behaviors to be applied in specific situations (Armitage, 2006; Gollwitzer & Sheeran, 2006). By determining how to behave in a given situation in advance, individuals create a connection between a possible situation in memory and the behavior that will be applied in that situation (Armitage, 2006; Gollwitzer & Sheeran, 2006). In other words, when faced with situation Y, a person pre-determines that they will perform behavior Z to achieve goal X (Gollwitzer, 1999). Intentions directed toward goals can be defined as instructions individuals give themselves to perform certain behaviors or achieve certain desired outcomes (Triandis, 1980). In addition, goal-directed intentions determine the situation the individual wants to create or achieve, while implementation intentions determine the behaviors the person will perform to reach that goal and their context (Gollwitzer, 1999). Since individuals need to identify critical situations that may arise in the future during the implementation intention process, these situations become mentally active and, therefore, more accessible (Gollwitzer, 1999). As a result, individuals become more aware of stimuli related to their goals in their environment (Aarts et al., 1999; Parks-Stamm et al., 2007; Webb & Sheeran, 2007), making it easier for them to achieve their goals (Gollwitzer, 1999).

Implementation intentions detail how and when individuals will achieve their goals and serve as a self-regulatory tool for achieving those goals (Gollwitzer & Sheeran, 2006). Its

self-regulatory structure is an important factor in overcoming environmental and internal challenges that may arise during the goal-achievement process (Gollwitzer & Sheeran, 2006; Gollwitzer et al., 2011). In particular, implementation intentions have been found to be an effective method for creating new behavior patterns to replace old habits (Adriaanse et al., 2011; Holland et al., 2006). Research has suggested that the implementation intentions method is effective in quitting smoking (Armitage, 2006; Conner & Higgins, 2010; Webb et al., 2009), dieting (Adriaanse et al., 2011), physical activity (Andersson & Moss, 2011; Milne et al., 2002), reducing fat consumption (Nooijer et al., 2006), undergoing cervical cancer screening (Sheeran & Orbell, 2000), weight control (Armitage et al., 2014), healthy eating (Verplanken & Faes, 1999), academic performance (Webb & Sheeran, 2007), procrastination behavior (Owens et al., 2008), and driving behaviors (Brewster et al., 2015; Elliott and Armitage, 2006; Tekeş, 2018).

There are studies showing that implementation intention is effective in the context of environmental behavior, such as the use of public transportation (Bamberg, 2000), and recycling habits (Rise et al., 2003). However, no study has yet been found that particularly examines the role of implementation intention in the various contexts of electricity-saving such as attitude, motivation, and behavior in adults. Since increasing electricity-saving behavior means changing individuals' existing habits and adding new behavioral patterns, it is believed that implementation intention can be effective in creating new behavioral patterns. Therefore, the role of intention formation in increasing electricity-saving should be addressed in different cultures and countries.

### 1.6.2. Transtheoretical model: Readiness to change

There are many factors that influence the effectiveness of intention implementation in inducing behavior change in individuals in the context of social psychology: Behavior intentions (Guillaumie et al., 2012), the strength of existing habits (Webb et al., 2009), planning skills (Allan et al., 2013), environmental support (Hall et al., 2012), self-regulation problems (Gollwitzer, 1999), the strength of goal intentions (Sheeran et al., 2005), and finally, readiness for change (Arden & Armitage, 2008; Armitage, 2006; Armitage & Arden, 2008) are among the most studied factors.

Readiness for change refers to how willing individuals are to change their behaviors and is an integral part of the Transtheoretical Model (Prochaska & DiClemente, 1983). According to the Transtheoretical Model, there are five stages of behavior change: precontemplation, contemplation, preparation, action, and maintenance (Arden & Armitage,

2008; Armitage, 2006; Prochaska & Velicer, 1997). In the precontemplation stage, individuals do not yet have an intention to change their behavior. Individuals in this stage may not have enough information about the negative effects of their behavior, or they may have previously tried to change their behavior but failed. In both cases, individuals tend to avoid information about the consequences of their behavior. The contemplation stage is when individuals have the intention to change their behavior. In this stage, individuals are aware of the positive aspects of behavior change but are also aware of the negative aspects of the process, which can create ambivalence and cause individuals to remain in this stage for a long time. In the preparation stage, individuals aim to take action to change their behavior in the near future and generally have a plan in place. Individuals in the action stage have made significant changes in their lives and exhibit observable behavioral changes. However, according to the Transtheoretical Model, action alone is not sufficient because, for example, reducing the number of cigarettes smoked is an action, but the goal of quitting smoking has not yet been achieved. Finally, the goal of the maintenance stage is to prevent the behavior from returning to its previous state (Prochaska & Velicer, 1997).

Prochaska and DiClemente's (1983) original version of the Stages of Change Algorithm consists of 5 mentioned stages. However, in literature, there are number of studies using shorter versions of the scale. To assess smoking cessation behavior DiClemente and colleagues (1991) preferred a three-dimensional version (precontemplation, contemplation and preparation). Polak and colleagues (2023) used a two-dimensional version (action and contemplation) to examine home cooking behavior. Similarly, Martin-Diener and colleagues (2004) also preferred a two-dimensional (pre-contemplation and preparation) version to examine physical activity and Bell and colleagues (2016) used a two-dimensional (precontemplation and preparation) version to examine adolescents' electricity consumption behavior.

Research shows that the effectiveness of the implementation intention model is related to the stage of readiness for change of individuals (Arden & Armitage, 2008; Armitage, 2006; Armitage & Arden, 2008). A study on smoking cessation shows that individuals in the preparation stage quit smoking at a higher rate than those in the pre-contemplation stage (Armitage & Arden, 2008). In addition, the Transtheoretical Model has been studied in different areas of health behavior and has yielded significant results. Experimental studies are conducted on alcohol use (DiClemente & Hughes, 1990; Norcross et al., 1991; Snow et al., in press), cocaine use (Rossi et al., 1993), exercise (Marcus et al., 1992; Lam et al., 1988),

mammography screening (Rakowski et al., 1992; Rakowski et al., 1993; Skinner et al., 1994), psychotherapy (McConnaughy et al., 1983; Norcross & Procshaska, 1986), and sunscreen use (Rossi, 1989). In addition, there are studies showing that the Transtheoretical Model is effective in the areas of eating behavior (Di Noia & Prochaska, 2010), fruit and vegetable consumption (Mainvil et al., 2010), and contraceptive use (Gulette et al., 2009).

The study conducted by Bell and colleagues (2016) on adolescents aimed at reducing electricity consumption shows that the implementation intention model is more effective in individuals who are already engaging in electricity-saving behaviors. However, the comparison could only be made between participants who were already engaging in electricity-saving behavior and those who were not due to the uneven distribution of stages in the Transtheoretical Model (Bell et al., 2016). Therefore, there is a need for studies that provide an equal distribution of stages, allowing comparisons to be made between each stage. Additionally, findings show that individuals can transition between stages of readiness for change, and stage-based models are more effective in increasing health behavior compared to standard models (Dijkstra et al., 1998; Quinlan & McCaul, 2000). Finally, research suggests that individuals need to be in the advanced stages of change for implementation intention to be more effective in behavior change and that the model is effective in promoting progression through the stages of change (Armitage & Arden, 2002; Armitage et al., 2003, 2004; Sheeran & Orbell, 1999, 2000; Verplanken & Faes, 1999).

As discussed above, implementation intention (Gollwitzer, 1999) and readiness for change (Arden & Armitrage, 2008) are models that are effective in behavior change, and they have various applications in the literature on pro-environmental behaviors (Bamberg, 2000; Bell et al., 2016; Rise et al., 2003).

### 1.7. Aim

As mentioned above, it is known that implementation intention is an effective method for creating behavioral changes in individuals (Gollwitzer, 1999). Additionally, it is a method that can be applied to all segments of society due to its individual-focused, easy-to-implement, cost-effective and fast structure (Armitage, 2006). Further, scholars argue that its self-regulatory structure is an important factor in overcoming environmental and internal challenges that may arise during the goal-achievement process (Gollwitzer & Sheeran, 2006; Gollwitzer et al., 2011) and there are studies showing that implementation intention is effective in the context of environmental behavior, such as the use of public transportation

(Bamberg, 2000), and recycling habits (Rise et al., 2003). However, one of the important factors for implementation intention to be more effective is argued to be readiness for change (Arden & Armitage, 2008; Armitage, 2006; Armitage & Arden, 2008; Prochaska & Velicer, 1997). It is discussed how effective behavioral changes will be in individuals, at what stage of change the individual is in, and how far individuals can progress in their change stages with implementation intention (Armitage & Arden, 2002; Armitage et al., 2003, 2004; Sheeran & Orbell, 1999, 2000; Verplanken & Faes, 1999). Research shows that the effectiveness of the implementation intention model is related to the stage of readiness for change of individuals (Arden & Armitage, 2008; Armitage, 2006; Armitage & Arden, 2008). Also, Bell and colleagues' (2016) research on adolescents aimed at reducing electricity consumption shows that the implementation intention model is more effective in individuals who are already engaging in electricity-saving behaviors. Considering all, it was thought that readiness for change and implementation intention may also have a role in improving electricity-saving behavior.

In light of all this information, the main aim of this study is to investigate the effect of implementation intention and readiness for change on attitude, motivation and behavior toward electricity-saving. To achieve this, first, the stages of individuals' readiness for change are determined from the perspective of the transtheoretical model, and then the expected changes in individuals at different stages are observed through the implementation intention manipulation to be applied. Since there is not yet enough literature using both models together in electricity-saving context, it is exploratory to examine which stages of the transtheoretical model implementation intention will yield better results.

### 1.8. Hypotheses

Considering all these, the hypotheses of this study are as follows:

***H1:*** Participants' post-measurement attitudes, motivations and behaviors toward electricity-saving will be higher than the pre-measurement ones due to the effect of implementation intention.

***H2:*** The stage of readiness to change will influence participants' attitudes, behaviors and motivations toward electricity-saving.

***H3:*** Implementation intention and readiness to change will have a significant interaction on participants' attitudes, behaviors and motivations toward electricity-saving.

# 2. METHOD

## 2.1. Participants

The sample of this study consists of 92 individuals who are above 18 years of age. The data of the participants who did not complete all the questions in the given surveys and/or who did not complete both pre-measures and post-measures were not included in the analysis. Apart from these, there were not any other exclusion criteria. As given in Table 2, the mean age of the participants ($N = 92$) was 29.9 ($SD = 13.00$) and the mean income of the participants was 18287.3 ($SD = 26886.21$). Also, as can be seen in Table 1, 54.3% of the sample consists of individuals who were single, 22.8% of them were in a relationship, 16.3% of them were married and 6.5% of them were divorced. Further, while 64.1% of the participants completed high school, 26.1% of them completed a university, 7.6% of them completed a master's degree and 2.2% of them completed a doctoral degree.

**Table 2.1.** *Demographic Characteristics of Participants (N = 92)*

| Variables | *n* | *%* |
|---|---|---|
| Relationship Status | | |
| Single | 50 | 54.3 |
| In a relationship | 21 | 22.8 |
| Married | 15 | 16.3 |
| Divorced | 6 | 6.5 |
| Education | | |
| Primary School | 0 | 0 |
| Middle School | 0 | 0 |
| High School | 59 | 64.1 |
| University | 24 | 26.1 |
| Master's Degree | 7 | 7.6 |
| Doctorate | 2 | 2.2 |

**Table 2.2.** *Descriptive Statistics of Participants (N = 92)*

| Variables | *Mean* | *SD* | *Minimum* | *Maximum* | *Skewness* | *Kurtosis* |
|---|---|---|---|---|---|---|
| Age | 29.93 | 13.00 | 19 | 67 | 1.40 | .61 |
| Income | 18287.30 | 26886.21 | 1000 | 150000 | 2.30 | 7.24 |

## 2.2. Measurement

### 2.2.1. Volitional help sheet

The Volitional Help Sheet was developed by Armitage (2008) for the purpose of applying intention formation manipulation in smoking cessation behavior and has since been used in various behavior change studies such as fast driving (Brewster et al., 2015), increasing physical activity (Andersson & Moss, 2011; Milne et al., 2002), and recycling habits (Rise et al., 2003) in the relevant literature. Participants are first given some critical situations ("If...") and asked to choose different behaviors they can use in these situations ("then..."). Participants are expected to match the critical situations and appropriate strategies given in the "if/then" format. After matching the critical situations and appropriate strategies, participants are asked to write down their matches to reinforce the implementation intention manipulation, as used in Tekeş (2018). There are various studies in the literature using the Volitional Help Sheet with changes, but it is seen that there are approximately 20 "if" and 20 "then" sentences presented to participants, and 4 matches are requested. (Brewster et al., 2015; Tekeş, 2018). In this study, it is aimed to maintain consistency with the literature by preserving that criterion.

For the control group, the Volitional Sheet used in Tekeş' (2018) study, which does not include any critical situations and appropriate strategies related to environmental behavior, is preferred (Appendix 8). There are no predetermined correct answers for the given critical situations and appropriate strategies. Participants can match the strategy they feel closest to for each critical situation based on their own evaluations. The Volitional Help Sheet differs from goal intentions as it requires individuals to detail their intentions for a critical situation and plan accordingly, and according to the relevant literature, it provides better results (Bieleke et al., 2018).

Since there is no Volitional Help Sheet specifically designed for electricity-saving behavior, it is created using various critical situations that participants may encounter regarding electricity consumption and the different strategies that can be applied in response

to these situations to be used in the experimental group for this study by the researcher (Appendix 7). The critical situations that are included in the Volitional Help for the study includes phrases like "If I think I am using too much electricity..." or "If I decide to save electricity...". Examples of strategies that can be used in response to these situations include phrases such as "then I will think about the decreasing resources on Earth" or "then I will inform people around me about the importance of electricity saving.".

### 2.2.2. Stages of change algorithm

The Stages of Change Scale was developed by Prochaska and DiClemente (1983) to determine at which stage of behavioral change individuals are in terms of quitting smoking, and has since been used in various behavior change areas such as alcohol use (DiClemente & Hughes, 1990; Norcross et al., 1991; Snow et al., in press), exercise (Marcus et al., 1992; Lam et al., 1988), and fruit and vegetable consumption (Mainvil et al., 2010). The Stages of Change Algorithm consists of five stages, and participants are asked five different questions that they are required to answer Yes or No to (Prochaska & DiClemente, 1983). In this study, the Stages of Change Algorithm for Electricity Savings, developed by Bell et al. (2016), is adapted to Turkish by the researcher (Appendix 6). The questions are as follows: (precontemplation) "I am not currently practicing electricity savings at home and I am not considering starting", (contemplation) "I am not currently practicing electricity savings at home, but I am considering starting", (preparation) "I am currently practicing electricity savings at home, but not regularly", (action) "I am currently practicing electricity savings at home, but only started doing so recently/within the last 6 months", and (maintenance) "I am currently practicing electricity savings at home and have been doing so for a long time/more than 6 months". The stage of behavior change in which participants are in is determined based on their Yes or No responses to given questions. Even though Prochaska and DiClemente's (1983) original version of the Stages of Change Algorithm consists of 5 mentioned stages, shorter versions of the scale are used in the literature. DiClemente and colleagues (1991) used a three-dimensional version (precontemplation, contemplation and preparation) to examine smoking cessation, Polak and colleagues (2023) used a two-dimensional version (action and contemplation) to examine home cooking, Martin-Diener and colleagues (2004) used a two-dimensional (pre-contemplation and preparation) version to examine physical activity and Bell and colleagues (2016) also used a two-dimensional (precontemplation and preparation) version to examine adolescents' electricity consumption. For this study, Polak and colleagues' (2023) version is preferred. In order to distinguish

participants' readiness to change stage their answers to the given stage of change algorithm were taken into account. Participants who answered "Yes" to the first given question stating, "Are you currently saving electricity?" were assigned to the action stage of change and participants who answered "No" to the mentioned question were assigned to the contemplation stage (Appendix 6).

### 2.2.3. The attitude towards energy conservation scale

The Attitude Towards Energy Conservation Scale was developed by Abrahamse and Steg (2009) to measure individuals' attitudes towards energy saving. It consists of 4 items, has a single-factor structure, and is measured on a 5-point Likert scale (1=Strongly disagree, 5=Strongly agree). All items in the scale are reverse-coded, and high scores indicate positive attitudes towards energy saving. The Cronbach's alpha coefficient for the scale is reported as .74. The original scale developed by Abrahamse and Steg (2009) was translated into Turkish by Yıldırım (2017), and a pilot study was conducted with 172 participants. The reliability (α) value of the scale was reported as .70 in both the pilot and the main studies. In this study, the translation by Yıldırım (2017) is used (Appendix 3).

### 2.2.4. Energy conservation behavior scale

The Energy Conservation Behavior Scale is a 13-item, 5-point Likert scale (1=Never, 5=Always) developed by Yıldırım (2017) using items from DeWaters' (2011) and Sahin's (2013) Energy Literacy Scale. DeWaters' scale had a 3-dimensional structure, including (1) individual energy consumption behavior, (2) purchasing of energy-saving equipment in the household, and (3) adjusting the home temperature for energy conservation. In Yıldırım's (2017) study, the dimensions of purchasing energy-saving equipment and adjusting home temperature were modified to include family, roommates, and dormitory management. Sahin's (2013) study considered the scale as a two-dimensional structure, and Yıldırım (2017) also used a two-dimensional version including Eco-management and Persuasion Behavior. The eco-management subdimension refer to participants' level of engagement in behaviors to prevent and solve environment-related issues and the persuasion behavior subdimension refers to participants' level of efforts to convience their family and friends to engage in energy saving behaviors. The Cronbach's alpha value for DeWaters' (2011) scale was reported as .81, while Sahin's (2013) was reported as .72. The scale items were translated into Turkish by Yıldırım (2017), and a pilot study was conducted with a sample of 320 participants. 8 items had Cronbach's alpha values below .30 in the pilot study and were excluded from the main study. Therefore, the scale was used with 13 items. There are no

reverse-coded items in the final version (13-item version) of the scale, thus higher scores indicate higher energy conservation behavior. In this study, the 13-item version of the scale is used (Appendix 4).

### 2.2.5. Motivation towards energy conservation scale

The Motivation Towards Environment Scale was developed by Pelletier and colleagues (1998) and adapted to Turkish by Karaaslan (2013). The scale consists of 21 items and is in a 7-point Likert format (1= Strongly disagree, 7=Strongly agree), with 6 sub-dimensions: (1) intrinsic, (2) integrated, (3) identified, (4) introjected, (5) external, and (6) amotivation. The Cronbach's alpha values for the sub-dimensions were reported to be between .70 and .90. Yıldırım (2017) adapted the Motivation Towards Environment Scale to the energy-saving perspective, resulting in the Motivation Towards Energy Conservation Scale, which includes 32 items. 11 items were newly created by Yıldırım (2017) to fit the energy-saving context, and a pilot study was conducted with 172 participants. 6 items with factor loadings below .30 were removed, and the final version of the scale contains 26 items. The 6-factorial structure of the Motivation Towards Environmental Scale could not be provided through the pilot study conducted by Yıldırım (2017). It was found a latent correlation between intrinsic and identified, intrinsic and introjected, integrated and introjected, identified and introjected types of motivations. Since the found highly correlations are argued to be violated the discriminant validity, it was concluded that intrinsic, integrated, identified and introjected types of motivation can be clustered as one dimension. Thus, a 4-factorial dimension including self-determined motivation, introjected motivation, external motivation and amotivation was used and suggested by Yıldırım (2017). Self-determined motivation refers to participants' level of internalization of the behavior into their selves, external motivation refers to non-autonomous and externally led motivations, introjected motivation refers to motivations that are led by avoidance of guilt and shame and lastly amotivation refers to nonmotivated, no sense of purpose and no sense of expectation-based motivations. The 26-item and 4-factorial dimension version of the scale is used in this study (Appendix 5).

### 2.2.6. Demographic information form

Demographic Information Form is created by the researcher including questions such as participants' age, gender, education, the total number of individuals living in the household, their work/study types (remote, on office, hybrid) and so on (Appendix 9).

## 2.3. Procedure

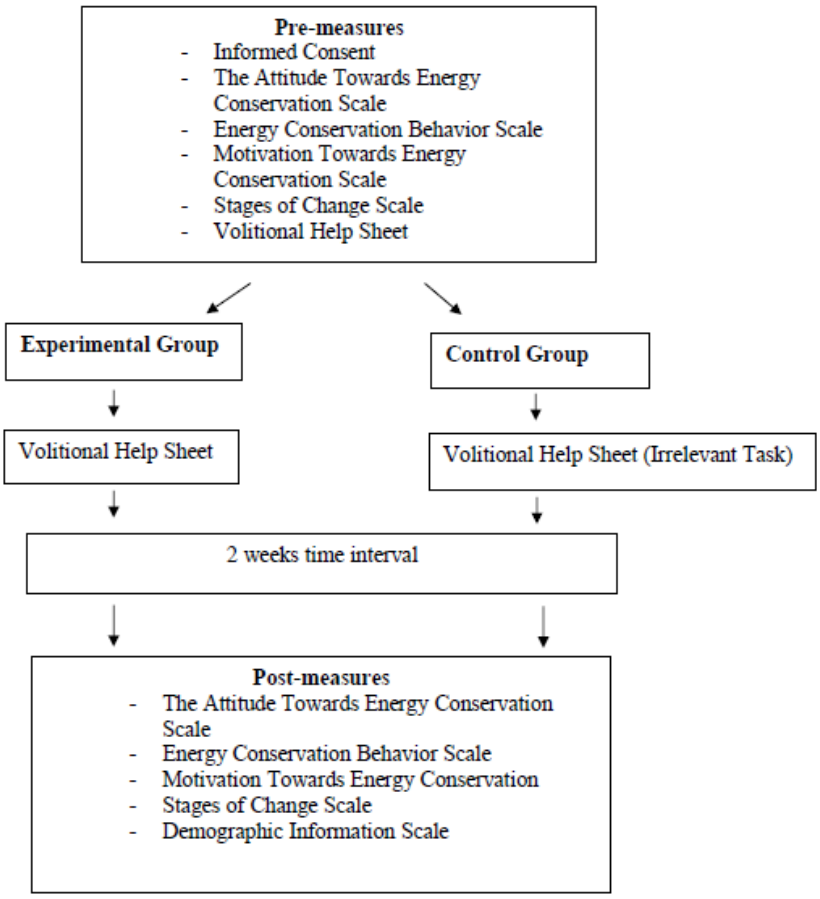
Before starting the research required permission was obtained from Başkent University Institutional Review Board (Appendix 14). For the pre-measures participants were reached through several social media and communication channels (i.e., Twitter, Instagram, Whatsapp) (Appendix 11). Individuals who agreed to participate in the study received a survey link created on www.qualtrics.com. When participants clicked on the link, they were asked to answer several questions which are as follows:

1. First, the participants received the informed consent and were asked to agree to take part in the study (Appendix 1).
2. Participants who agreed to take part in the study were then asked to provide their email address and create a nickname using the first two letters of their last name, day of birth and month of birth (Appendix 2). Created nicknames and email addresses awee asked each part of the study in order to keep track of and match their answers.
3. After creating a nickname, participants were asked to answer the questions of The Attitude Towards Energy Conservation Scale (Appendix 3), Energy Conservation Behavior Scale (Appendix 4), Motivation Towards Energy Conservation (Appendix 5), Stages of Change Scale (Appendix 6) in a randomized order.
4. Lastly, after answering all the mentioned questions, participants were directed to the ending page of the survey.

After the pre-measures participants were randomly assigned to experimental and control group. Volitional Help Sheet was sent to participants through e-mail (Appendix 12). Participants assigned to the experimental group received the link to the Volitional Help Sheet for experimental condition (Appendix 7) created by the researcher and participants assigned to the control group received the link to the Volitional Help Sheet for control group (Appendix 8) in Tekeş' (2018) study. After two weeks of time intervals of participants' completion of the Volitional Help Sheet, they received a link to the post-measure (Appendix 13) which includes The Attitude Towards Energy Conservation Scale (Appendix 3), Energy Conservation Behavior Scale (Appendix 4), Motivation Towards Energy Conservation (Appendix 5), Stages of Change Scale (Appendix 6) and Demographic Information Scale (Appendix 9). After completing the mentioned post-measure questions, participants were directed to the debrief page (Appendix 10). All questions in all scales were counterbalanced

using www.qualtrics.com. All measurements were given in the Appendix. The summary of the procedure is given in Figure 1 below.

**Figure 2.1.** Experimental Design of The Study




## 2.4. Statistical Analyses

The data analysis was conducted through SPSS (Statistical Package for Social Sciences) 26 program and Jamovi Desktop 2.3.28. program. In order to analyze the main hypothesis of the study, Mixed Model Repeated Measures ANOVA was used. The measurement time (pre-measurement, post-measurement) was measured as within-subject factor, whereas readiness to change (action, contemplation) and implementation intention manipulation (experimental, control) were measured as between-subject factors.

# 3. RESULTS

## 3.1. Results of the Attitude Towards Energy Conservation Scale

### 3.1.1. 2 (experiment vs. control) x 2 (baseline x follow-up) x 2 (action x contemplation) mixed model repeated measures ANOVA

Mixed Model Repeated Measures ANOVA was conducted to analyze the main effects of conditions, time and readiness to change on participants' attitude toward energy conservation and the interactions between time and condition, time and readiness to change and time, condition and readiness to change. Readiness to change (contemplation x action) and implementation intention (experiment x control) were measured as between-subjects factors and different measurement times (baseline x follow-up) were measured as within-subjects factors. Since The Attitude Towards Energy Conservation Scale is one dimensional, only the overall scores of the participants were examined.

**Table 3.1.** *Attitude Towards Energy Conservation 2 (Experiment vs. Control) x 2 (Baseline vs. Follow-up) x 2 (Action vs. Contemplation) Mixed Model Repeated Measures ANOVA*

| Predictor | $df_{Num}$ | $df_{Den}$ | $F$ | $p$ | $np^2$ |
|---|---|---|---|---|---|
| Time | 1 | 88 | 31.70 | < .001* | .26 |
| Implementation Intention | 1 | 88 | 2.64 | .108 | .02 |
| Readiness to Change | 1 | 88 | 6.54 | .013** | .68 |
| Time x Implementation Intention | 1 | 88 | .75 | .388 | .00 |
| Time x Readiness to Change | 1 | 88 | .49 | .483 | .00 |
| Time x Readiness to Change x Implementation Intention | 1 | 88 | .00 | .928 | .00 |

**p <.001 ** p < .05*

As can be seen in Table 3 the main effect of time ($F(1, 88) = 31.70$, $p < .001$, $\eta p2 = .26$) on **attitude toward energy conservation** was statistically significant. For the time variable, the baseline level ($M = 11.9$, $SD = .41$) was lower than the follow-up level ($M = 14.3$, $SD = .31$). The main effect of readiness to change ($F(1, 88) = 6.54$, $p = .013$, $\eta p2 = .06$) was also statistically significant. For the readiness to change variable, the contemplation level ($M = 12.4$, $SD = .50$) lower was than the action level ($M = 13.9$, $SD = .30$). The main effect of implementation intention ($F(1, 88) = 2.64$, $p = .108$, $\eta p2 = .02$) was statistically non-significant. The interaction between time and implementation intention ($F(1, 88) = .75$, $p =$

.388, *ηp2* = .00), time and readiness to change ($F(1, 88) = .49$, $p = .483$, *ηp2* = .00) and time, implementation intention and readiness to change ($F(1, 88) = .00$, $p = .928$, *ηp2* = .00) were statistically non-significant.

## 3.2. Results of the Energy Conservation Behavior Scale

### 3.2.1. 2 (experiment vs. control) x 2 (baseline x follow-up) x 2 (action x contemplation) mixed model repeated measures ANOVA

Mixed Model Repeated Measures ANOVA was conducted to analyze the main effects of conditions, time and readiness to change on participants' energy conservation behavior. Readiness to change (contemplation x action) and implementation intention (experiment x control) were measured as between-subjects factors and different measurement times (baseline x follow-up) were measured as within-subjects factors. The interactions between time and condition, time and readiness to change and time, condition and readiness to change. Since The Energy Conservation Behavior Scale has two dimensions including Eco-management and Persuasion Behavior, both the total scores and the separate dimensions were examined.

**Table 3.2.** *Behavior Towards Energy Conservation 2 (Experiment vs. Control) x 2 (Baseline vs. Follow-up) x 2 (Action vs. Contemplation) Mixed Model Repeated Measures ANOVA*

| Predictor | $df_{Num}$ | $df_{Den}$ | $F$ | $p$ | $np^2$ |
|---|---|---|---|---|---|
| Time | 1 | 88 | 6.67 | .011** | .07 |
| Implementation Intention | 1 | 88 | 2.64 | .108 | .02 |
| Readiness to Change | 1 | 88 | 25.35 | < .001* | .22 |
| Time x Implementation Intention | 1 | 88 | 1.38 | .243 | .01 |
| Time x Readiness to Change | 1 | 88 | 4.92 | .029** | .05 |
| Time x Readiness to Change x Implementation Intention | 1 | 88 | 3.63 | .060 | .04 |

**p <.001 ** p < .05*

Table 4 shows that the main effect of time ($F(1, 88) = 6.67$, $p = .011$, *ηp2* = .07) on **energy conservation behavior** was statistically significant. For the time variable, the baseline level ($M = 46.50$, $SD = 9.02$) was lower than the follow-up level ($M = 48.3$, $SD = 8.32$). The main effect of readiness to change ($F(1, 88) = 25.35$, $p < .001$, *ηp2* = .22) was

statistically significant. For the readiness to change variable, the action level ($M$ = 11.9, $SD$ = .41) was lower than the follow-up level ($M$ = 14.3, $SD$ = .31). Further, the main effect of Implementation Intention ($F$(1, 88) = 2.64, $p$ = .108, $\eta p2$ = .02) on energy conservation behavior was not significant. The interaction between time and readiness to change ($F$(1, 88) = 4.92, $p$ = .029, $\eta p2$ = .05) was statistically significant and the interaction between time, implementation intention and readiness to change ($F$(1, 88) = 3.63, $p$ = .060, $\eta p2$ = .04) was marginally significant. The interaction between time and Implementation Intention ($F$(1, 88) = 1.38, $p$ = .243, $\eta p2$ = .01) was statistically non-significant.

**Table 3.3** *Two-way Interaction Effect Between Time and Readiness to Change on Behavior Towards Energy Conservation*

| Comparison | | | | $p_{bonferroni}$ |
|---|---|---|---|---|
| Time | Readiness to Change | | | |
| Baseline | Action | Baseline | Contemplation | **Decrease** *(p < .001)* |
| | | Follow-up | Action | n.s. |
| | | Follow-up | Contemplation | n.s. |
| Baseline | Contemplation | Follow-up | Action | **Increase** *p < .001* |
| | | Follow-up | Contemplation | **Increase** *p = 0 .037* |
| Follow-up | Action | Follow-up | Contemplation | n.s. |

**Bonferroni Post-Hoc Test was conducted.*

As the summary shown in Table 5, the Bonferroni Post-Hoc Test was conducted to assess the significance of differences between time and readiness to change variables for energy conservation behavior. The results indicated that action scores in baseline level ($M$ = 49.2, $SD$ = 1.00) were significantly higher than contemplation scores in baseline level ($M$ = 38.9, $SD$ = 1.65). Contemplation scores in baseline level ($M$ = 38.9, $SD$ = 1.65) were significantly lower than action scores in follow-up level ($M$ = 49.6, $SD$ = .99). Lastly, contemplation scores in baseline-level ($M$ = 38.9, $SD$ = 1.65) were significantly lower than contemplation scores in follow-up level ($M$ = 44.7, $SD$ = 1.64).

**Table 3.4.** *Means and Standard Deviation of the IV levels (Time, Implementation Intention, Readiness to Change) for Energy Conservation Behavior*

| **Time & Implementation Intention & Readiness to Change** | ***Mean*** | ***SD*** |
|---|---|---|
| Baseline & Experimental & Action | 49.0 | 1.23 |
| Baseline & Experimental & Contemplation | 39.9 | 1.99 |
| Baseline & Control & Action | 49.5 | 1.59 |
| Follow-up & Experimental & Action | 50.3 | 1.22 |
| Baseline & Control & Contemplation | 38.0 | 2.65 |
| Follow-up & Experimental & Contemplation | 42.0 | 1.97 |
| Follow-up & Control & Action | 49.0 | 1.58 |

Further, the Bonferroni Post-Hoc Test was conducted to assess the significance of differences between time, implementation intention and readiness to change variables for energy conservation behavior. The result indicated that the mean score for experimental group's action scores in baseline level ($M$ = 49.0, $SD$ = 1.23) were significantly lower than experimental group's contemplation scores in baseline level ($M$ = 39.9, $SD$ = 1.99). Control group's action scores in baseline level ($M$ = 49.5, $SD$ = 1.59) were significantly higher than control group's contemplation scores in baseline level ($M$ = 38.0 $SD$ = 2.65). Experimental group's contemplation scores in baseline level ($M$ = 39.9, $SD$ = 1.99) were significantly lower than control group's action scores in baseline level ($M$ = 49.5, $SD$ = 1.59). Experimental group's contemplation scores in baseline level ($M$ = 39.9, $SD$ = 1.99) were significantly lower than control group's action scores in follow-up level ($M$ = 49.0, $SD$ = 1.58). Control group's action scores in baseline level ($M$ = 49.5, $SD$ = 1.59) were significantly higher than control group's contemplation scores in baseline level ($M$ = 38.0, $SD$ = 2.65). Control group's action scores in baseline level ($M$ = 49.5 $SD$ = 1.59) were significantly higher than experimental group's contemplation scores in follow-up level ($M$ = 42.0, $SD$ = 1.97). Control group's contemplation scores in baseline level ($M$ = 38.0, $SD$ = 2.65) were significantly lower experimental group's action scores in follow-up level ($M$ = 50.3, $SD$ = 1.22). Control group's contemplation scores in baseline level ($M$ = 38.0, $SD$ = 2.65) were significantly lower than control group's action scores in follow-up level ($M$ = 49.0, $SD$ = 1.58). Lastly, experiment group's action scores in follow-up level ($M$ = 50.3, $SD$ = 1.22) were significantly higher than experimental group's contemplation scores in follow-up level ($M$ = 42.0, $SD$ = 1.97), (see Table 7 below for details).

**Table 3.5.** *Three-way Interaction Effect Between Time, Readiness to Change and Implementation Intention on Energy Conservation Behavior*

| | | | Comparison | | | |
|---|---|---|---|---|---|---|
| Time | Group | Readiness to Change | | | | $p_{bonferroni}$ |
| Baseline | Experimental | Action | Baseline | Experimental | Contemplation | **Increase** *(p = .005)* |
| | | | Baseline | Control | Contemplation | **Decrease** *(p = .007)* |
| Baseline | Control | Action | Baseline | Experimental | Contemplation | **Decrease** *(p = .007)* |
| Baseline | Experimental | Contemplation | Baseline | Experimental | Action | **Increase** *(p = 0.008)* |
| | | | Baseline | Control | Action | **Increase** *(p < .001)* |
| | Control | Action | Follow-up | Experimental | Action | **Decrease** *(p = 0.012)* |
| | | | Follow-up | Control | Action | **Decrease** *(p = 0.001)* |
| | | Contemplation | Follow-up | Experimental | Action | **Increase** *(p = .013)* |
| | | | Follow-up | Control | Action | **Increase** *(p = 0.012)* |

*Note:* Bonferonni Post-Hoc Test was conducted. Non-significant post-hoc comparisons were not included to this table.

**Table 3.6.** *Eco-management Behavior Towards Energy Conservation 2 (Experiment vs. Control) x 2 (Baseline vs. Follow-up) x 2 (Action vs. Contemplation) Mixed Model Repeated Measures ANOVA*

| Predictor | $df_{Num}$ | $df_{Den}$ | $F$ | $p$ | $np^2$ |
|---|---|---|---|---|---|
| Time | 1 | 88 | 7.16 | .009** | .07 |
| Implementation Intention | 1 | 88 | .19 | .660 | .00 |
| Readiness to Change | 1 | 88 | 25.35 | < .001* | .07 |
| Time x Implementation Intention | 1 | 88 | .97 | .327 | .01 |
| Time x Readiness to Change | 1 | 88 | 6.03 | .016** | .06 |
| Time x Readiness to Change x Implementation Intention | 1 | 88 | 3.63 | .333 | .04 |

**p <.001 ** p < .05*

As can be seen on Table 8 the main effect of time ($F$(1, 88) = 7.16, $p$ = .009, $\eta p2$ = .07) on **eco-management** was statistically significant. For the time variable, baseline level ($M$ = 44.1, $SD$ = .97) was lower than follow-up level ($M$ = 47.2, $SD$ = .96). The main effect of Implementation Intention ($F$(1, 88) = .19, $p$ = .660, $\eta p2$ = .00) on eco-management was statistically non-significant. The main effect of readiness to change ($F$(1, 88) = 25.35 $p$ < .001, $\eta p2$ = .07) on eco-management was statistically significant. Accordingly, for the readiness to change variable, action level ($M$ = 31.7, $SD$ = .46) was higher than contemplation level ($M$ = 28.1, $SD$ = .75). The interaction between time and readiness to change ($F$(1, 88) = 6.03, $p$ = .016, $\eta p2$ = .06) was statistically significant. Lastly, the interaction between time and Implementation Intention ($F$(1, 88) = .97, $p$ = .327, $\eta p2$ = .01) and interaction between time, Implementation Intention and readiness to change ($F$(1, 88) = 3.63, $p$ = .333, $\eta p2$ = .04) were not significant.

**Table 3.7.** *Two-way Interaction Effect Between Time and Readiness to Change on Eco-management Behavior Towards Energy Conservation*

| Comparison | | | | $P_{\text{bonferroni}}$ |
|---|---|---|---|---|
| Time | Readiness to Change | | | |
| Baseline | Action | Baseline | Contemplation | **Decrease** *(p < .001)* |
| | | Follow-up | Action | n.s. |
| | | Follow-up | Contemplation | n.s. |
| Baseline | Contemplation | Follow-up | Action | **Increase** *(p < .001)* |
| | | Follow-up | Contemplation | **Increase** *(p < .001)* |
| Follow-up | Action | Follow-up | Contemplation | n.s. |

**Bonferroni Post-Hoc Test was conducted.*

As can be seen on Table 9, the Bonferroni Post-Hoc Test was conducted to assess the significance of differences between time and readiness to change variables for eco-management. The results indicated that action scores in baseline level ($M$ = 31.7, $SD$ = .59) were significantly higher than contemplation scores in baseline level ($M$ = 26.4, $SD$ = .98). Contemplation scores in baseline level ($M$ = 26.4, $SD$ = .98) were significantly lower than action scores in follow-up level ($M$ = 31.8, $SD$ = .56). Lastly, contemplation scores in baseline level ($M$ = 26.4, $SD$ = .98) were significantly lower than contemplation scores in follow-up level ($M$ = 29.9, $SD$ = .93).

**Table 3.8.** *Persuasion Behavior 2 (Experiment vs. Control) x 2 (Baseline vs. Follow-up) x 2 (Action vs. Contemplation) Mixed Model Repeated Measures ANOVA*

| Predictor | $df_{Num}$ | $df_{Den}$ | $F$ | $p$ | $np^2$ |
|---|---|---|---|---|---|
| Time | 1 | 88 | 4.87 | .030** | .05 |
| Implementation Intention | 1 | 88 | .02 | .865 | .00 |
| Readiness to Change | 1 | 88 | 25.82 | < .001* | .22 |
| Time x Implementation Intention | 1 | 88 | 1.65 | .201 | .01 |
| Time x Readiness to Change | 1 | 88 | 2.91 | .091 | .03 |
| Time x Readiness to Change x Implementation Intention | 1 | 88 | 8.11 | .005* | .08 |

**p <.001 ** p < .05*

As shown in Table 10, the main effect of time ($F$(1, 88) = 4.87, $p$ = .030, $\eta p2$ = .05) on **persuasion behavior** was statistically significant. For the time variable, baseline level ($M$ = 15.0, $SD$ = .49) was lower than follow-up level ($M$ = 16.2, $SD$ = .48). The main effect of Implementation Intention ($F$(1, 88) = .02, $p$ = .865, $\eta p2$ = .00) was statistically non-

significant and the main effect of readiness to change ($F(1, 88) = 25.82$, $p < .001$, $\eta p2 = .22$) was statistically significant. For the readiness to change variable, action level ($M = 17.6$, $SD = .41$) was higher than follow-up level ($M = 13.6$, $SD = .67$). The interaction between time, Implementation Intention and readiness to change ($F(1, 88) = 8.11$, $p = .005$, $\eta p2 = .08$) was statistically significant. The interaction between time and Implementation Intention ($F(1, 88) = 1.65$, $p = .201$, $\eta p2 = .01$) and time and readiness to change ($F(1, 88) = 2.91$, $p = .091$, $\eta p2 = .03$) were not significant.

**Table 3.9.** *Means and Standard Deviation of the IV levels (Time, Implementation Intention, Readiness to Change) for Persuasion Behavior*

| **Time & Implementation Intention & Readiness to Change** | ***Mean*** | ***SD*** |
|---|---|---|
| Baseline & Experimental & Contemplation | 13.8 | 1.01 |
| Baseline & Control & Action | 18.2 | 0.80 |
| Follow-up & Experimental & Action | 18.1 | 0.61 |
| Baseline & Control & Contemplation | 11.3 | 1.34 |
| Follow-up & Experimental & Contemplation | 13.0 | 0.98 |
| Follow-up & Control & Action | 17.6 | 0.79 |

The Bonferroni Post-Hoc Test was conducted to assess the significance of differences between time, condition and readiness to change for persuasion behavior. The result indicated that the mean score for control group's action scores in baseline level ($M = 18.2$, $SD = 0.80$) were significantly higher than control group's contemplation scores in baseline level ($M = 11.3$ $SD = 1.34$). Experimental group's contemplation scores in baseline level ($M = 13.8$, $SD = 1.01$) were significantly lower than control group's action scores in baseline level ($M = 18.2$, $SD = 0.80$). Experimental group's contemplation scores in baseline level ($M = 13.8$, $SD = 1.01$) were significantly lower than control group's action scores in follow-up level ($M = 17.6$, $SD = 0.79$). Control group's action scores in baseline level ($M = 18.2$, $SD = 0.80$) were significantly higher than control group's contemplation scores in baseline level ($M = 11.3$, $SD = 1.34$). Control group's action scores in baseline level ($M = 18.2$ $SD = 0.80$) were significantly higher than experimental group's contemplation scores in follow-up level ($M = 13.6$, $SD = 0.98$). Control group's contemplation scores in baseline level ($M = 11.3$, $SD = 1.34$) were significantly lower experimental group's action scores in follow-up level ($M = 18.1$, $SD = 0.61$). Control group's contemplation scores in baseline level ($M = 11.3$, $SD = 1.34$) were significantly lower than control group's action scores in follow-up level ($M = 17.6$, $SD = 0.79$). Experiment group's action scores in follow-up level ($M = 18.1$, $SD = 0.61$) were significantly higher than experimental group's contemplation scores in follow-up level ($M = 13.06$, $SD = 0.98$), (see Table 12 below for details).

**Table 3.10.** *Three-way Interaction Effect Between Time, Readiness to Change and Implementation Intention on Persuasion Behavior Towards Energy Conservation*

| Comparison | | | | | | |
|---|---|---|---|---|---|---|
| Time | Group | Readiness to Change | | | | $p_{bonferroni}$ |
| Baseline | Experimental | Contemplation | Baseline | Control | Action | **Increase** *(p = 0.028)* |
| | | | Follow-up | Experimental | Action | **Increase** *(p = 0.011)* |
| | Control | Action | Baseline | Control | Contemplation | **Decrease** *(p = 0.001)* |
| | | | Follow-up | Experimental | Contemplation | **Decrease** *(p = 0.018)* |
| | | Contemplation | Follow-up | Experimental | Action | **Increase** *(p < .001)* |
| | | | Follow-up | Control | Action | **Increase** *(p = 0.004)* |
| Follow-up | Experimental | Action | Follow-up | Experimental | Contemplation | **Decrease** *(p = 0.006)* |

*Note:* Bonferonni Post-Hoc Test was conducted. Non-significant post-hoc comparisons were not included to this table.

## 3.3. Results of the Motivation Towards Energy Conservation Scale

### 3.3.1. 2 (experiment vs. control) x 2 (baseline x follow-up) x 2 (action x contemplation) mixed model repeated measures ANOVA

Mixed Model Repeated Measures ANOVA was conducted to analyze the main effects of conditions, time and readiness to change on participants' motivation towards energy conservation and the interactions between time and condition, time and readiness to change and time, condition and readiness to change. Readiness to change (contemplation x action) and implementation intention (experiment x control) were measured as between-subjects factors and different measurement times (baseline x follow-up) were measured as within-subjects factors. Since The Motivation Towards Energy Conservation Scale has four dimensions including Self-Determination, External Motivation, İntrojected and Amotivation both the total scores and the separate dimensions were examined.

**Table 3.11.** *Motivation Towards Energy Conservation 2 (Experiment vs. Control) x 2 (Baseline vs. Follow-up) x 2 (Action vs. Contemplation) Mixed Model Repeated Measures ANOVA*

| Predictor | $df_{Num}$ | $df_{Den}$ | $F$ | $p$ | $np^2$ |
|---|---|---|---|---|---|
| Time | 1 | 88 | 12.79 | < .001* | .12 |
| Implementation Intention | 1 | 88 | .99 | .321 | .01 |
| Readiness to Change | 1 | 88 | 19.27 | < .001* | .18 |
| Time x Implementation Intention | 1 | 88 | .00 | .981 | .00 |
| Time x Readiness to Change | 1 | 88 | 11.77 | < .001* | .11 |
| Time x Readiness to Change x Implementation Intention | 1 | 88 | .44 | .505 | .00 |

**p <.001 ** p < .05*

As shown in Table 13, the main effect of time ($F(1, 88) = 12.79$, $p < .001$, $\eta p2 = .127$ on **motivation towards energy conservation** was statistically significant. For the time variable, the baseline level ($M = 81.0$, $SD = 1.22$) was lower than follow-up level ($M = 85.8$, $SD = .91$). The main effect of Implementation Intention ($F(1, 88) = .99$, $p = .321$, $\eta p2 = .01$) was not significant and the main effect of readiness to change ($F(1, 88) = 19.27$, $p < .001$, $\eta p2 = .18$) was statistically significant. For the readiness to change variable the action level ($M = 87.1$, $SD = .87$) was higher than the contemplation level ($M = 79.7$, $SD = 1.43$). The interaction between time and readiness to change ($F(1, 88) = 11.77$, $p < .001$, $\eta p2 = .11$) was

statistically significant. Also, the interaction between time and Implementation Intention ($F(1, 88) = .00$, $p = .981$, $\eta p2 = .00$) and the interaction between time, Implementation Intention and readiness to change ($F(1, 88) = .44$, $p = .505$, $\eta p2 = .00$) were statistically non-significant.

**Table 3.12.** *Two-way Interaction Effect Between Time and Readiness to Change on Motivation Towards Energy Conservation*

| Comparison | | | | $P_{\text{bonferroni}}$ |
|---|---|---|---|---|
| Time | Readiness to Change | | | |
| Baseline | Action | Baseline | Contemplation | **Decrease** *(p < .001)* |
| | | Follow-up | Action | **Decrease** *(p = .001)* |
| | | Follow-up | Contemplation | **Decrease** *(p < .001)* |
| Baseline | Contemplation | Follow-up | Action | **Increase** *(p = .020)* |
| | | Follow-up | Contemplation | n.s. |
| Follow-up | Action | Follow-up | Contemplation | n.s. |

**Bonferroni Post-Hoc Test was conducted.*

As given in Table 14, the Bonferroni Post-Hoc Test was conducted to assess the significance of differences between time and readiness to change variables for motivation towards electricity conservation. The results indicated that action scores in baseline level ($M = 87.0$, $SD = 1.27$) were significantly higher than contemplation scores in baseline level ($M = 74.9$, $SD = 2.09$). Contemplation scores in baseline level ($M = 74.9$, $SD = 2.09$) were significantly lower than action scores in follow-up level ($M = 87.2$, $SD = .94$). Lastly, contemplation scores in baseline level ($M = 74.9$, $SD = 2.09$) were significantly lower than contemplation scores in follow-up level ($M = 84.4$, $SD = 1.56$).

**Table 3.13.** *Self-determined Motivation Towards Energy Conservation 2 (Experiment vs.Control) x 2 (Baseline vs. Follow-up) x 2 (Action vs. Contemplation) Mixed Model Repeated Measures ANOVA*

| Predictor | $df_{Num}$ | $df_{Den}$ | $F$ | $p$ | $np^2$ |
|---|---|---|---|---|---|
| Time | 1 | 88 | .31 | .575 | .00 |
| Implementation Intention | 1 | 88 | 21.25 | < .001* | .00 |
| Readiness to Change | 1 | 88 | 12.01 | < .001* | .19 |
| Time x Implementation Intention | 1 | 88 | 1.54 | .218 | .01 |
| Time x Readiness to Change | 1 | 88 | 12.01 | < .001* | .12 |
| Time x Readiness to Change x Implementation Intention | 1 | 88 | .77 | .383 | .00 |

**p <.001 ** p < .05*

Table 15 shows that the main effect of time ($F(1, 88) = .31$, $p = .575$, $\eta p2 = .00$) on **self-determined motivation** was statistically non-significant. The main effect of Implementation Intention ($F(1, 88) = .03$, $p = .862$, $\eta p2 = .00$) was also statistically non-significant. However, the main effect of readiness to change ($F(1, 88) = 21.25$, $p < .001$, $\eta p2 = .19$) was statistically significant. For the readiness to change variable, the action level ($M = 47.8$, $SD = .51$) was higher than the contemplation level ($M = 43.7$, $SD = .85$). The interaction between time and readiness to change ($F(1, 88) = 12.01$, $p < .001$, $\eta p2 = .12$) was statistically significant. The interaction between time and Implementation Intention ($F(1, 88) = 1.54$, $p = .218$, $\eta p2 = .01$) and the interaction between time, Implementation Intention and readiness to change ($F(1, 88) = .77$, $p = .383$, $\eta p2 = .00$) were statistically non-significant.

**Table 3.14** *Two-way Interaction Effect Between Time and Readiness to Change on Self-determined Motivation Towards Energy Conservation*

| Comparison | | | | Pbonferroni |
|---|---|---|---|---|
| Time | Readiness to Change | | | |
| Baseline | Action | Baseline | Contemplation | **Decrease** *(p < .001)* |
| | | Follow-up | Action | **Decrease** *(p = .001)* |
| | | Follow-up | Contemplation | **Decrease** *(p < .001)* |
| Baseline | Contemplation | Follow-up | Action | **Increase** *(p = .020)* |
| | | Follow-up | Contemplation | n.s. |
| Follow-up | Action | Follow-up | Contemplation | n.s. |

**Bonferroni Post-Hoc Test was conducted.*

As given in Table 16, the Bonferroni Post-Hoc Test was conducted to assess the significance of differences between time and readiness to change variables for self-determination. The results indicated that action scores in baseline level ($M$ = 49.4, $SD$ = .77) were significantly higher than contemplation scores in baseline level ($M$ = 42.1, $SD$ = 1.27). Action scores in baseline level ($M$ = 49.4, $SD$ = .77) were significantly higher than action scores in follow-up level ($M$ = 46.2, $SD$ = .53). Action scores in baseline level ($M$ = 49.4, $SD$ = .77) were significantly higher than contemplation scores in follow-up level ($M$ = 44.4, $SD$ = .88). Contemplation scores in baseline level ($M$ = 42.1, $SD$ = 1.27) were significantly lower than action scores in follow-up level ($M$ = 46.2, $SD$ = .53). Lastly, action scores in follow-up level ($M$ = 46.2, $SD$ = .53) were significantly higher than contemplation scores in follow-up level ($M$ = 44.4, $SD$ = .88).

**Table 3.15.** *External Motivation Towards Energy Conservation 2 (Experiment vs.Control) x 2 (Baseline vs. Follow-up) x 2 (Action vs. Contemplation) Mixed Model Repeated Measures ANOVA*

| Predictor | $df_{Num}$ | $df_{Den}$ | $F$ | $p$ | $np^2$ |
|---|---|---|---|---|---|
| Time | 1 | 88 | .00 | .947 | .00 |
| Implementation Intention | 1 | 88 | 3.22 | .076 | .03 |
| Readiness to change | 1 | 88 | 5.13 | .026* | .05 |
| Time x Implementation Intention | 1 | 88 | 5.13 | .026* | .05 |
| Time x Readiness to Change | 1 | 88 | .02 | .886 | .00 |
| Time x Readiness to Change x Implementation Intention | 1 | 88 | 1.90 | .171 | .02 |

**p <.001 ** p < .05*

The main effect of time ($F$(1, 88) = .00, $p$ = .947, $\eta p2$ = .00) on **external motivation** was not statistically significant. The main effect of Implementation Intention ($F$(1, 88) = 5.57, $p$ = .020, $\eta p2$ = .06) was statistically significant. For the Implementation Intention variable, the experimental condition ($M$ = 9.1, $SD$ = .37) was higher than the control condition ($M$ = 7.6, $SD$ = .49). The main effect of readiness to change ($F$(1, 88) = 3.22, $p$ = .076, $\eta p2$ = .03) were also statistically non-significant. The interaction between time and Implementation Intention ($F$(1, 88) = 5.13, $p$ = .026, $\eta p2$ = .05) was statistically significant. The interactions between time and readiness to change ($F$(1, 88) = .02, $p$ = .886, $\eta p2$ = .00) and time, Implementation Intention and readiness to change ($F$(1, 88) = 1.90, $p$ = .171, $\eta p2$ = .02) were statistically non-significant.

**Table 3.16.** *Two-way Interaction Effect Between Time and Readiness to Change on External Motivation Towards Energy Conservation*

| Comparison | | | | $P_{\text{bonferroni}}$ |
|---|---|---|---|---|
| Time | Implementation Intention | | | |
| Baseline | Experimental | Baseline | Control | n.s. |
| | | Follow-up | Experimental | n.s. |
| | | Follow-up | Control | n.s. |
| Baseline | Control | Follow-up | Experimental | n.s. |
| | | Follow-up | Control | n.s. |
| Follow-up | Experimental | Follow-up | Control | **Decrease** *(p = .004)* |

**Bonferroni Post-Hoc Test was conducted.*

As given in Table 18, The Bonferroni Post-Hoc Test was conducted to assess the significance of differences between time and Implementation Intention variables for external motivation. The results indicated that experimental group's scores in follow-up level ($M$ = 9.5, $SD$ = .38) are significantly different than control group's scores in follow-up level ($M$ = 7.2, $SD$ = .51).

**Table 3.17.** *Introjected Motivation Towards Energy Conservation 2 (Experiment vs.Control) x 2 (Baseline vs. Follow-up) x 2 (Action vs. Contemplation) Mixed Model Repeated Measures ANOVA*

| Predictor | $df_{Num}$ | $df_{Den}$ | $F$ | $p$ | $np^2$ |
|---|---|---|---|---|---|
| Time | 1 | 88 | 25.09 | < .001* | .22 |
| Implementation Intention | 1 | 88 | .17 | .679 | .00 |
| Readiness to Change | 1 | 88 | 22.14 | < .001* | .20 |
| Time x Implementation Intention | 1 | 88 | 1.43 | .234 | .01 |
| Time x Readiness to Change | 1 | 88 | 15.05 | < .001* | .14 |
| Time x Readiness to Change x Implementation Intention | 1 | 88 | 1.42 | .235 | .01 |

**p <.001 ** p < .05*

Table 19 shows that the main effect of time ($F$(1, 88) = 25.09, $p$ < .001, $\eta p2$ = .22) on **introjected motivation** was statistically significant. For the time variable, the baseline level ($M$ = 12.8, $SD$ = .37) was lower than the follow-up level ($M$ = 15.0, $SD$ = .40). The main effect of Implementation Intention ($F$(1, 88) = .17, $p$ = .679, $\eta p2$ = .00) was statistically non-significant and the main effect of readiness to change ($F$(1, 88) = 22.14, $p$ < .001, $\eta p2$ = .20)

was statistically significant. For the readiness to change variable, the action level ($M$ = 15.4, $SD$ = .33) was higher than the contemplation level ($M$ = 12.4, $SD$ = .55). The interaction between time and readiness to change ($F(1, 88) = 15.05$, $p < .001$, $\eta p2 = .14$) was statistically significant. The interaction between time and Implementation Intention ($F(1, 88) = 1.43$, $p = .234$, $\eta p2 = .01$) and the interaction between time, Implementation Intention and readiness to change ($F(1, 88) = 1.42$, $p = .235$, $\eta p2 = .01$) were statistically non-significant.

**Table 3.18.** *Two-way Interaction Effect Between Time and Readiness to Change on Introjected Motivation Towards Energy Conservation*

| Comparison | | | | $P_{\text{bonferroni}}$ |
|---|---|---|---|---|
| Time | Readiness to Change | | | |
| Baseline | Action | Baseline | Contemplation | **Decrease** *(p < .001)* |
| | | Follow-up | Action | n.s. |
| | | Follow-up | Contemplation | n.s. |
| Baseline | Contemplation | Follow-up | Action | **Increase** *(p < .001)* |
| | | Follow-up | Contemplation | **Increase** *(p < .001)* |
| Follow-up | Action | Follow-up | Contemplation | n.s. |

**Bonferroni Post-Hoc Test was conducted.*

As the summary provided in Table 20, the Bonferroni Post-Hoc Test was conducted to assess the significance of differences between time and readiness to change variables for introjected motivation. The results indicated that action scores in baseline level ($M$ = 15.5, $SD$ = .38) were significantly higher than contemplation scores in baseline level ($M$ = 10.5, $SD$ = .61). Contemplation scores in baseline level ($M$ = 10.5, $SD$ = .61) were significantly lower than action scores in follow-up level ($M$ = 15.7, $SD$ = .41). Lastly, contemplation scores in baseline level ($M$ = 10.5, $SD$ = .61) were significantly lower than contemplation scores in follow-up level ($M$ = 14.3, $SD$ = .88).

**Table 3.19.** *Amotivation 2 (Experiment vs. Control) x 2 (Baseline vs. Follow-up) x 2 (Action vs. Contemplation) Mixed Model Repeated Measures ANOVA*

| Predictor | $df_{Num}$ | $df_{Den}$ | $F$ | $p$ | $np^2$ |
|---|---|---|---|---|---|
| Time | 1 | 88 | 2.21 | .141 | .02 |
| Implementation Intention | 1 | 88 | .00 | .928 | .00 |
| Readiness to Change | 1 | 88 | 2.26 | .136 | .02 |
| Time x Implementation Intention | 1 | 88 | 3.82 | .053 | .04 |
| Time x Readiness to Change | 1 | 88 | .02 | .877 | .00 |
| Time x Readiness to Change x Implementation Intention | 1 | 88 | .00 | .954 | .00 |

**p <.001 ** p < .05*

As can be seen in Table 21, the main effect of time ($F(1, 88) = 2.21$, $p = .141$, $\eta p2 = .02$) on **amotivation** was statistically non-significant. The main effect of Implementation Intention ($F(1, 88) = .00$, $p = .928$, $\eta p2 = .00$) and the main effect of readiness to change ($F(1, 88) = 2.26$, $p = .136$, $\eta p2 = .02$) were also statistically non-significant. The interaction between time and Implementation Intention ($F(1, 88) = 3.83$, $p = .053$, $\eta p2 = .04$), time and readiness to change ($F(1, 88) = .02$, $p = .877$, $\eta p2 = .00$) and time, Implementation Intention and readiness to change ($F(1, 88) = .00$, $p = .954$, $\eta p2 = .00$) were also statistically non-significant.

### 3.4. Results of the Bivariate Correlations Between Investigated Variables

Based on the Pearson Correlation analysis, the baseline level of Attitude Towards Energy Conservation Scale (ATECS) and the baseline level of Energy Conservation Behavior Scale (ECBS) were positively correlated. Also, the baseline level of Attitude Towards Energy Conservation Scale (ATECS) and follow-up level of Energy Conservation Behavior Scale (ECBS) and the baseline level of Attitude Towards Energy Conservation Scale (ATECS) and follow-up level of Attitude Towards Energy Conservation Scale (ATECS) were positively correlated. Further, the baseline level of Energy Conservation Behavior Scale (ECBS) and baseline level of Motivation Towards Energy Conservation Scale (MTECS) were positively correlated. The baseline level of Energy Conservation Behavior Scale (ECBS) and the follow-up level of Energy Conservation Behavior Scale (ECBS) were also positively correlated. The baseline level of Motivation Towards Energy Conservation Scale (MTECS) and the follow-up level of Motivation Towards Energy Conservation Scale (MTECS) were positively correlated. The follow-up level of Attitude Towards Energy Conservation Scale (ATECS) and the follow-up level of Energy Conservation Behavior Scale (ECBS) and the follow-up level of Attitude Towards Energy Conservation Scale (ATECS) and the follow-up level of Motivation Towards Energy Conservation Scale (MTECS) were also positively correlated. Lastly, the follow-up level of Energy Conservation Behavior Scale (ECBS) and the follow up level of Motivation Towards Energy Conservation Scale (MTECS) were positively correlated (see Table 20 for details).

**Table 3.20.** *Correlations Between Variables*

| | Variable | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ATECBS baseline | 12.3261 | 3.54 | 1 | | | | | |
| 2 | ECBS baseline | 46.4891 | 9.02 | .297* | 1 | | | | |
| 3 | MTECS baseline | 83.8804 | 11.18 | .196 | .603* | 1 | | | |
| 4 | ATECBS follow-up | 14.5761 | 2.77 | .373* | .069 | .121 | 1 | | |
| 5 | ECBS follow-up | 48.2500 | 8.32 | .210** | .332* | .091 | .494* | 1 | |
| 6 | MTECS follow-up | 86.6957 | 7.52 | .152 | .120 | .271* | .553 | .400* | 1 |

*Notes:* ATECBS=Attitude Towards Energy Conservation Behavior Scale, ECBS=Energy Conservation Behavior Scale, MTECS=Motivation Towards Energy Conservation Scale.

** $p < 0.05$, * $p < 0.01$

# 4. DISCUSSION

The main aim of this present thesis is to investigate the effect of implementation intention and readiness to change on participants' attitude, motivation and behavior toward electricity-saving which are measured through Attitude Towards Energy Conservation Scale, Energy Conservation Behavior Scale and Motivation Towards Energy Conservation Scale. Based on the current literature, it was hypothesized that (1) participants' post-measurement attitudes, motivations and behaviors toward electricity-saving will be higher than the pre-measurement ones due to the effect of implementation intention, (2) the stage of readiness to change will influence participants' attitudes, behaviors and motivations toward electricity-saving and (3) Implementation intention and readiness to change will have a significant interaction on participants' attitudes, behaviors and motivations toward electricity-saving.

Since most damage and destruction to the environment are significantly caused by human and societal behaviors (Lehman & Geller, 2004), research on behavioral change at the individual level is believed to contribute to both literature and the practical field.

Gollwitzer & Sheeran (2006) suggest that the implementation intention's self-regulatory structure is an important factor in overcoming environmental and internal challenges in terms of pro-environmental goal-achievement processes. Further, there is various research showing the impact of implementation intention on the use of public transportation (Bamberg, 2000), and recycling habits (Rise et al., 2003). In addition, research shows that the effectiveness of the implementation intention model is related to the stage of readiness for change of individuals (Arden & Armitage, 2008; Armitage, 2006; Armitage & Arden, 2008). It also is argued that the implementation intention intervention's effective in promoting progression through the stages of change (Armitage & Arden, 2002; Armitage et al., 2003, 2004; Sheeran & Orbell, 1999, 2000; Verplanken & Faes, 1999). Even though no research has yet been found that particularly examines the effects of implementation intention and readiness to change on adults' electricity-saving context, since increasing electricity-saving behavior would mean replacing existing habits with new behavioral patterns it was believed that implementation intention and readiness to change would also be effective in increasing participants' attitude, motivation and behavior toward electricity-saving.

Addedly, most research covering the effects of implementation intention (Adriaanse et al., 2011; Andersson & Moss, 2011; Armitage, 2006; Armitage et al., 2014; Conner & Higgins, 2010; Milne et al., 2002; Nooijer et al., 2006; Sheeran & Orbell, 2000; Webb et al., 2009; Verplanken & Faes, 1999) and / or readiness to change (DiClemente & Hughes, 1990; Marcus et al., 1992; Norcross et al., 1991; Rossi et al., 1993; Snow et al., in press) only focuses on the behavioral outcome. It was believed that examining motivation, attitude and behavior as separate dimensions would provide a broader understanding of the effectiveness of implementation intention intervention.

### 4.1. Discussion on the Results of Attitude Toward Electricity-Saving

The results indicated a non-significant interaction between time and implementation intention, time and readiness to change and time, implementation intention and readiness to change.

It is discussed that attitudes refer to the summary of one's evaluation of certain objects, subjects, oneself or others and it varies within a continuum from negative to positive (Petty et al., 1997). Object-evaluation plays a crucial role in functioning of the attitudes and they can be automatically activated (Fazio, 1995). Further, Petty and colleagues (1997) argue that attitude measures fail to distinguish the different aspects and meanings of the attitudes.

In terms of attitude change, there are variety of approaches. The constructionist approach argues that different activated information and time intervals of attitude judgement formed influence attitude change. The file-drawer approach on the other hand, argues that attitude change is influenced by underlying memory representation of the attitude. Combining the mentioned approaches, it is suggested that attitude change is associated with both stored evaluations' retrieval and new evaluations' considerations (Bohner & Dickel, 2011). Also, Wilson and colleagues' (2000) study shows that old attitudes remain while the new ones are being created and participants possess implicit and explicit evaluations at the same time toward opposite valence and evaluative judgments on context are influenced by the accessibility of stored evaluations and ability and motivation of attitude reflection. Addedly, in literature, there are various research examining the factors affecting individuals' attitude toward pro-environmental behaviors. Kemmelmeier and colleagues (2002) argue that economic factors play a significant role in certain pro-environmental attitudes. Klineberg and colleagues (1998) argue that demographic factors such as age, education, political ideology and gender have a relationship with pro-environmental attitudes.

Implementation intention is a model aimed at creating behavioral intentions through establishing a connection between a possible situation in memory and the behavior to be applied in that situation (Armitage, 2006; Gollwitzer & Sheeran, 2006). Even though no research has yet been found on the effects of implementation intention on electricity-saving attitudes, based on the aforementioned arguments and studies, it is concluded that implementation intention by nature may not be a very effective model for electricity-saving attitude change.

Also, numerous research show that participants that are in the preparation stage are more prone to behavioral and attitudinal change due to the effect of implementation intention interventions (Arden & Armitage, 2008; Armitage, 2006; Armitage & Arden, 2008). However, mentioned studies used a five-dimensional (pre-contemplation, contemplation, preparation, action and maintenance) version of the readiness to change while in this study a two-dimensional (contemplation and action) version was preferred which may be the possible reason for the found non-significant results. Also, the mentioned factors affecting attitude change can also be the possible reasons for the found non-significant results in terms of readiness to change.

### 4.2. Discussion on the Results of Behavior Toward Electricity-Saving

First of all, when participants' behavior toward electricity-saving was examined in general, it was found that implementation intention did not affect the electricity-saving behavior. However, readiness to change was found to have an effect on electricity-saving behavior. Also, it was found that implementation and readiness to change had an interaction effect on electricity-saving behavior. Nevertheless, it is important to highlight that the aforementioned found interaction effect was a marginal effect. Based on these, it can be concluded that the second and the third hypotheses of this study were supported.

When the group comparison was examined for the effect of readiness to change, as expected it was seen that during the pre-measure period, participants who were currently saving electricity were reported to have higher levels of electricity-saving behavior compared to those who were not saving electricity. In literature, there are various studies showing the influencing factors of pro-environmental behaviors (Botetzagias et al., 2015; Brécard et al., 2009; Dal et al., 2015; Hage et al., 2009; Halvorsen, 2012; Klöckner & Oppedal, 2011; Lakhan, 2015; Nordlund & Garvill, 2003; Pretty, 2003; Saphores et al., 2012; Schwartz, 1977; Steg & Vlek, 2009; Zhu, 2016; Zsoka et al., 2013) which can be the possible reasons for the mentioned difference. Further, examined group comparison showed that

during the pre-measure period participants who were not saving electricity reported to have lower levels of electricity-saving behavior compared to those who were saving electricity during the post-measure period. Chib and colleagues (2009) argue that the last two stages of change (action and maintenance) can be defined as behavioral dimensions related to actual behavioral change. Surprisingly, during the pre-measure period participants who were not saving electricity were reported to have lower levels of electricity-saving behavior compared to those who were saving electricity during the post-measure period. Even though mentioned result was not line with the existing literature, preferred two-dimensional version of the readiness to change is argued to be the possible reason for this. Thus, further research with five-dimensional version is needed.

In detail, Hage and colleagues (2009) suggest that individual norms influenced by social norms have an impact on recycling behavior. The most argued influences on individual norms by social norms are argued to be avoiding social disapproval and seeking social esteem (Halvorsen, 2012; Klöckner & Oppedal, 2011; Lakhan, 2015; Pretty, 2003; Schwartz, 1977). Further, several research indicated that women, married couples, high-income levels and urban residents tend to engage in more pro-environmental behaviors (Botetzagias et al., 2015; Brécard et al., 2009; Saphores et al., 2012). Political interest and social capital are also found to be associated with pro-environmental behaviors (Torgler & García-Valiñas, 2005). Also, several research indicated the relationship between environmental attitude and environmental behaviors (Dal et al., 2015; Nordlund & Garvill, 2003; Steg & Vlek, 2009; Zhu, 2016; Zsoka et al., 2013).

Addedly, when the group comparison for readiness to change and implementation intention was examined, as expected readiness to change had an effect on participants' energy conservation behavior. In other words, participants who are already saving electricity reported to have higher levels of energy conservation behavior compared to those who were not saving electricity. The possible reasons for the mentioned effect are argued to be similar to the below discussion on the effect of readiness to change. More significantly, due to the effect of implementation intention, participants who are saving electricity also reported to have higher levels of energy conservation behavior compared to those who were not. Implementation intention is argued to be more effective used with readiness to change and research shows that individuals' responsiveness in terms of implementation intention is associated with their stages of change (Arden & Armitage, 2008; Armitage, 2006; Armitage & Arden, 2008).

To be more precise, research shows that participants in the preparation stage are more likely to engage in behavioral change due to the effect of implementation intention (Arden & Armitage, 2008; Armitage, 2006; Armitage & Arden, 2008). Also, Bell (2016) argues that implementation intention can be served as a self-regulatory tool for adolescence to engage in energy serving behavior through shielding their environmental and internal challenges related to breaking old habits.

Further, implementation intentions are argued to be the most effective when the desired behaviors have a brief window of action (Milkman et al., 2011). Carrera and colleagues (2018) suggest that repeated behaviors such as exercise do not have a brief window of action and individuals can easily procrastinate. It is believed that behavior toward electricity-saving has the mentioned limitations. Even if the strategies given to the participants during implementation intention became salient, participants may choose not to act right at that moment. Further, according to the Theory of Reasoned Action, self-shaped attitudes and peer-shaped subjective norms influence behavioral intentions. Also, some scholars argue that there is a gap between behavioral intentions and the behavior itself (Dixit et al., 2014; Fielding et al., 2016; Zhang et al., 2016) and cultural, contextual and structural factors have an impact on the mentioned gap awareness (Liu & Bai, 2014). Further, Webb and colleagues (2009) argue that if the effect of implementation intention on strong habits is small, this can also limit its efficacy. Lastly, participants' weak commitment to the given goal intention (Sheeran et al., 2005), low self-efficacy related to the intended behavior (Wieber et al., in press) and socially prescribed perfectionism (Webb et al., 2007) are found to limit the effectiveness of implementation intention. Since the mentioned factors were not examined under the scope of this present thesis, they can be the other possible reasons for the found non-significant effect of implementation intention.

Since the behavior toward electricity-saving can also be examined through different subdimensions, **eco-management behavior and persuasion behavior** subdimensions were examined.

The results of the analysis **on eco-management behavior** subdimension indicated that implementation intention did not have an effect on eco-management behavior. Also, it was found that implementation and readiness to change did not have an interaction effect on eco-management behavior. However, readiness to change was found to affect participants' eco-management behavior toward electricity-saving. In light of this information, it can be concluded that the second hypothesis of this study was supported.

Eco-management subdimension refers to participants' engagement in actions directed at preventing or solving environmental problems (Yıldırım, 2017). When the group comparison was examined, as expected it was seen that during the pre-measure period, participants who were currently saving electricity were reported to have higher levels of electricity-saving behavior compared to those who were not saving electricity. Affective variables (Steg, 2008) together with other factors are discussed to influence energy-conservation behavior which can be the possible reasons for the above difference. Further, during the pre-measure period participants who were not saving electricity reported to have lower levels of eco-management behavior compared to those who were saving electricity during the post-measure period. As mentioned above on the behavior toward electricity-saving, Chib and colleagues (2009) state that action and maintenance stages of change are related to actual behavioral change. The intimated argument can be the possible reason for the found increase in participants' eco-management behavior. Flummoxedly, during the pre-measure participants were reported to have lower levels of eco-management behavior compared to post-measure even though all were not saving electricity. Similar to the behavior toward electricity-saving mentioned results were not in line with the existing literature and again which may be occurred as a result of using a two-dimensional readiness to change.

To be more precise, the Value-Belief-Norm Model (Stern et al., 1995) argues that there are certain values, beliefs and personal norms that have an impact on individuals' taken action and Stern and colleagues' (1999) research shows that mentioned predictors could be related to consumer behavior, willingness to sacrifice and environmental citizenship. Also, several studies show that there is a correlation between environmental behavior and personal and social norms (Bamberg & Schmidt, 2003; Bratt, 1999; Harland et al., 1999; Stern et al., 1999; Thøgersen, 1999). And Wakefield and colleagues' (2006) research reveals that context and social networks seem to be more significant than individual characteristics in terms of environmental behavior. Moreover, according to The Model of Action Phases (Heckhausen & Gollwitzer, 1987) behavior change consists of two phases: (1) Motivational phase and (2) volitional phase. Motivational phase refers to individuals' motivation towards achieving a specific goal and volitional phase refers to volitional (self-regulatory) skills to reach that goal. Some scholars argue that engaging in and sustaining pro-environmental behaviors are challenging processes because their consequences are not immediately observable and most of them do not directly affect individuals themselves (Leary et al., 2011). Also, there are various research showing that individuals believe the consequences of climate change and

global warming do not possess a direct threat to them, such consequences are not certain and will not occur in the near future (Clement et al., 2014; Gifford & Nilsson, 2011). Martinsson and colleagues (2011) suggest that low-income individuals tend to engage in more energy-saving behaviors and Steg (2008) highlights the importance of affective variables on this matter. According to Maio and colleagues (2007) behavior change is determined by both external and individual context. Further, self-interest and pro-social motives (Bamberg & Moser, 2007), availability of products, facilities and infrastructure (Olander & Thøgersen, 1995) influence pro-environmental behavior. In addition, Becker (1995) argues that internal and external circumstances, type of change, characteristics of the agent may influence the effectiveness of readiness to change. Addedly, it is argued that implementation intention's effect size is mostly modest, thus there are other psychological factors influencing the effects of implementation intention and the behavior itself (Sheeran & Orbell, 1999). Also, according to Brickell and colleagues (2006) degree of autonomy and choice can have an impact of the predictive validity of implementation intentions. In terms of increasing physical activity, implementation intentions are found to be influenced by subjective norms, instrumental attitude, affective attitude and perceived behavioral control (Rhodes et al., 2006). Further, Gollwitzer (1990) argues that the strength of formed implementation intention is associated with volitional goal strengths which refers to the degree of desire to achieve that goal. Mentioned factors can be the reasons for the found non-significant effect of implementation intention.

When the other subdimension of behavior toward electricity-saving, **the persuasion behavior**, was examined it was found that implementation intention and readiness to change did not have an effect on persuasion behavior. However, implementation intention and readiness to change were found to have an interaction effect on persuasion behavior toward electricity-saving. Based on these, it can be concluded that the third hypotheses of this study was supported.

Persuasion behavior refers to participants' effort to convince their friends and family to engage in electricity-saving behavior (Yıldırım, 2017). The group comparison indicated that, similar to the previously explained analysis readiness to change had an effect on persuasion behavior toward electricity-saving. Yıldırım (2017) argues that individuals' sense of autonomy, competence, and relatedness together with other factors are associated with persuasion behavior in terms of energy conservation. Most profoundly, it was found that during the pre-measure participants in the control group who were not saving electricity

reported to show lower levels of persuasion behavior compared to those who were saving electricity in the experimental group during post-measure. In other words, it can be concluded that due to the effect of implementation intention intervention and readiness to change participants' persuasion behavior levels increased. The items in the Energy Conservation Behavior Scale's persuasion behavior sub-dimension are argued to be consistent with collective action (Yıldırım, 2017) and some scholars define environmental activism as a process of collective action (Blake et al., 1997; Horton, 2003; Tindall, 2002; Walsh and Warland, 1983).

Precisely, low self-efficacy in communication is argued to negatively influence persuasion behavior (Yıldırım, 2017). Further, the level of awareness of energy policies and implications, the association between energy conservation and climate change and energy resources are discussed to be related to persuasion behavior (Yıldırım, 2017). When participants' perception of society's emphasis on energy conservation is high their attachments to society increase and they tend to engage in more persuasion behavior on this manner (Yıldırım, 2017). Addedly, Clayton (2003) suggests that the environmental perspective is more congruent with a collectivist orientation since most environmentalists have a tendency to focus more on community, ecosystems and interdependence of the systems. Also, the Collective Interest Model (Finkel et al., 1989) argues that individuals have a tendency to take part in collective actions when the expected value of their participation is perceived to be positive. Mentioned positive expected value occurs as a result of assessing the value of the public good, possible effects to the collective outcomes and the cost-benefit of their participation (Finkel et al., 1989).

Even though the aforementioned models and results provide a possible explanation of collective action and the relationship between collective action and environmental behavior, they are unable to explain the reason why individuals possess or have a tendency to engage in collective action rather than individual actions and the effects of implementation intention on this manner. Thus, in order to obtain a better understanding of this context further research is needed.

### 4.3. Discussion on the Results of Motivation Toward Electricity-Saving

Similar to behavior toward electricity-saving, first participants' motivation toward electricity-saving was examined in general. It was found that implementation intention did not affect motivation, also implementation intention and readiness to change did not have an interaction effect on motivation as well. However, readiness to change was found to have an

effect on participants' motivation toward electricity-saving. Considering these, it can be concluded that the second hypothesis of this study was supported.

When the group comparison was examined, not surprisingly, during the pre-measure participants who were saving electricity were reported to have higher levels of electricity-saving motivation compared to those who were not saving electricity. Transtheoretical Model (Prochaska & DiClemente, 1983; Prochaska & Marcus, 1994) suggests that participants who are in the higher stages of change possess higher motivation to change their behaviors compared to ones who are in the lower stages of change. The above findings are discussed to be consistent with the mentioned argument. Also, participants who were saving electricity in the pre-measure reported to have higher levels of motivation compared to those in the post-measure who did not save electricity. It is argued that motivational readiness to change (Belding et al., 1995; Carbonari et al., 1994; Carney & Kivlahan, 1995; DiClemente & Hughes, 1990; Isenhart, 1994) can be differ among the population and motivation for change can be differ among goals (DiClemente & Scott, 1997). Peculiarly, during the pre-measure participants were reported to have lower levels of motivation compared to post-measure even though all were not saving electricity. Besides the below-mentioned arguments on using a two-dimensional readiness to change, some scholars suggest that motivation as a personal factor has an effect on participants' readiness (Crnic & Lamberty, 1994; May & Campbell, 1981) which can be the possible reason for the found result.

Extensively, motivation for change is argued to be associated with behavioral outcomes, attitudinal and decisional considerations (DiClement, 1999) and motivational readiness is argued to be associated with coping mechanisms (DiClement et al., 1991). Also, Higgins and Budney (1993) emphasize the effects of incentives in modifying drug abuse however, mentioned effect is mostly found for short period of time. DiClement (1999) suggests that such short-term effect can be due to the distinction of motivation types especially intrinsic vs. extrinsic and Curry and colleagues (1990) suggests that intrinsic motivations are found to result in more long-term results compared to extrinsic motivations. Addedly, Vancampfort and colleagues (2013) research show that physical activity participation level and amotivation and intrinsic regulation are positively correlated.

Further, Pelletier and colleagues (1998) argue that environmental attitude and knowledge by themselves are not enough to understand and foster pro-environmental behaviors. Also, according to the Self-Determination Theory (Deci & Ryan, 1985, 1991) individuals' perceived level of agency and competence have an effect on their motivation levels. Further, Resnicow and colleagues (2008) argue that personal motivation can have an impact on

intervention, treatment effectiveness and adherence and Salvini and colleagues (2012) emphasized the significance of motivation on behavioral change. Blanchard and colleagues' (2003) study shows that participants' motivation toward treatment differs from their motivation to change their behaviors. Since the mentioned factors were not examined for this thesis, no conclusion can be made on this, and further research is needed to obtain a deeper understanding of the relationship between individuals' motivation towards electricity-saving and readiness to change.

Motivation toward electricity-saving can also be examined through its different subdimensions which are **self-determined, external, introjected motivation and amotivation.**

When the first subdimension **self-determined motivation** was examined it was found that implementation intention did not affect participants' self-determined motivation toward electricity-saving. Similarly, implementation intention and readiness to change were not found to have an interaction effect on self-determined motivation. However, readiness to change was found to affect participants' self-determined motivation. Based on this, it can be concluded that the second hypothesis of this study was supported.

The self-determined motivation refers to participants' internalization of the behavior into their selves and participants who have high level of self-determination are argued to engage in more energy conservation behavior because they internalized the behavior (Yıldırım, 2017).

The group comparison showed that, during the pre-measure period, participants who were currently saving electricity were reported to have higher levels of self-determined motivation compared to those who were not saving electricity. There are studies emphasizing the influencing factors on self-determined motivation (Pelletier, et al., 1998) which can be the possible reasons for the mentioned result. Further, examined group comparison showed that during the pre-measure period participants who were saving electricity reported to have higher levels of self-determined motivation compared to those who were not saving electricity during post-measure. There are several studies showing that participants in the early stages of change are less self-determined than the ones in later stages of change (Landry & Solmon, 2004; Mullan & Markland, 1997). Surprisingly, during the pre-measure participants who were not saving electricity reported to have lower levels self-determined motivation compared to those who were saving electricity during the post-measure. As mentioned before, using a two-dimensional readiness to change can be the possible reason for the found result.

To the fullest extent, according to the Self-Determination Theory (Deci & Ryan, 1985, 1991) there are 3 different types of motivation and all of them are considered to be on a self-determination continuum with respect to their implied level of self-determination. Also, positive psychological and behavioral consequences are argued to be led by high self-determined motivational subtypes and locus of control; and self-esteem are argued to be positively correlated with self-determined motivational subtypes (Pelletier, et al., 1998).

No research has yet been found the effects of implementation intention on self-determined motivation. However, since Self-Determination Theory bases all types of motivation on self-determination, it can be concluded that discussions on the motivation towards electricity-saving can also be applied here.

When the other subdimension of motivation toward electricity-saving, **external motivation** was examined it was found that, readiness to change did not affect participants' external motivation and similarly implementation intention and readiness to change did not have an interaction effect on external motivation. However, implementation intention was found to affect participants' external motivation toward electricity-saving. Thus, it can be concluded that the first hypothesis of this study was supported.

External motivation refers to non-autonomous and externally led motivations (Yıldırım, 2017). Based on the group comparison during the post-measure participants who received the implementation intention intervention reported to have higher levels of external motivation compared to those who did not receive implementation intention. The research on the motivation types (intrinsic vs. extrinsic) of pro-environmental behaviors has controversial results (Dedeurwaerdere et al., 2016; De Young, 1986; De Young & Robinson, 1984; Pelletier et all., 2004). Addedly, Self-Determination Theory suggests that extrinsic motivations are not unidimensional and vary within their relativeness to individuals' sense of autonomy (Ryan & Deci, 2000b) and when the value of externally motivated behavior is consciously accepted by individuals they contemplate engaging in that behavior (Ryan & Deci, 2000a,b; Ryan et al., 1996). Thus, aforementioned arguments can be possible reasons for the found result.

In detail, self-Determination Theory (Deci & Ryan, 1985, 1999) argues that individual behaviors are driven by two distinct processes: (1) intrinsic motivation and (2) internalizing externally motivated behavior. In terms of extrinsic motivation, individuals' interest in the activity is not based on the activity itself, instead it is about the positive outcomes or the avoidance of negative outcomes (Deci & Ryan, 1985, 1999). Thus, individuals' external

motivation is argued to reflect their tendency to fulfill others' needs and it is defined as the least autonomous and most controllingly experienced type of motivation (Ryan & Deci, 2000a, 2000b; Ryan et al., 1996). Chatzisarantis and colleagues' (2003) research shows that autonomous and controllingly experienced motivations are related to intentions and such intentions are found to mediate the effect of behavioral regulations. In terms of pro-environmental behavior, Dedeurwaerdere and colleagues (2016) defines following government regulations for protected species as extrinsic motivation. Addedly, research on adopting a healthy diet shows that the reason behind participants' adoption of dietary change goals may be influenced by external sources such as social pressure (Pelletier et all., 2004). On the contrary, material reuse and recycling (De Young, 1986) and water conservation (De Young & Robinson, 1984) are found to rely on intrinsic motivation. Similarly, De Ridder and colleagues (2009) argue that external motivation can also be efficient for adopting a goal but not acting upon to achieve that goal. Ryan and colleagues' (1995) research show that externally motivated individuals tend to take less responsibility and engage in less effort to achieve their goals and Sheldon and Elliot's (1998) research reveals that externally motivated individuals have lower possibilities of actually achieving their goals.

Addedly, research on exercise behavior show that extrinsic motivation is mostly associated with early stages of change and intrinsic motivation, on the other hand, is mostly related to regular exercise (Ingledew et al., 1998). Similar to this, Kudora and colleague's (2012) study shows that participants in the contemplation stage of change are more externally motivated. Also, Kushnir and colleagues' (2015) study shows that external and introjected motivations predict readiness to change. However, the findings of this research were not in line with the existing literature. The mentioned studies used five-dimensional version but the two-dimensonal version was preferred in this study. Therefore, the preference of a two-dimensional version can be the possible reason for the controversial results. Further, scholars argue that individuals with high level of external motivation tend to fail more during pre-actional and actional phases (Patterson et al., 1996; Ryan & Connell, Sheldon & Elliott, 1998; Williams et al., 1996) which may be another possible reason for the controversial results.

The results of another subdimension of motivation toward electricity saving, **introjected motivation** showed that implementation intention did not affect introjected motivation. Similarly, implementation intention and readiness to change did not have an interaction effect on participants' introjected motivation. However, readiness to change was found to be

effective on introjected motivation. In light of this information, it can be concluded that the second hypothesis of this study was supported.

Introjected motivation refers to motivations that are led by avoidance of guilt and shame (Yıldırım, 2017). When the group comparison was examined, it was found that during the pre-measure participants' who were currently saving electricity reported to have higher levels of introjected motivation compared to those who were not saving electricity. It is argued that internal pressure plays a crucial role in introjected motivations (Pelletier, et al., 1998) which can be the possible reason for the found result. Further, during the pre-measure participants who were not saving electricity reported to have lower levels of introjected motivation compared to those who were saving electricity during the post-measure. Daley and Duda's (2006) show that participants in the action stage of change show lower levels of introjected motivation compared to the ones in the preparation stage of change. However, since the mentioned study consists of a five-dimensional version of the readiness to change for a more accurate interpretation further research with five-dimensional readiness to change is needed. Lastly and not expectedly, participants who were not saving electricity during the pre-measure reported to have lower levels of introjected motivation compared to those who were saving electricity during the post-measure. As mentioned above, further research with five-dimensional readiness to change is argued to contribute to understanding this result.

To be more concrete, according to Self-Determination Theory (Deci & Ryan, 1985, 1991) introjected motivation is based on controlled internal regulations and individuals who possess high level of introjected motivation engage in behaviors to obtain approval from others and mentioned behaviors are mostly related to social pressure (Deci & Ryan, 1985). Herein, introjected and extrinsic motivations are considered as more controlled types and argued to result in less stable behavioral change (Ryan & Deci, 2000). As mentioned above, Kushnir and colleagues' (2015) study shows that external and introjected motivations predict readiness to change.

When the last subdimension of motivation toward electricity-saving, **amotivation,** was examined, it was found that implementation intention and readiness to change did not affect participants' amotivation. Similarly, implementation intention and readiness to change did not have an interaction effect on motivation.

Amotivation refers to nonmotivated, no sense of purpose and no sense of expectation-based motivations (Yıldırım, 2017). Amotivation is argued to be similar with learned helplessness and when individuals' behaviors and the outcomes of the behaviors are perceived to be non-contingent, amotivation occurs (Seligman, 1975). Further, when

individuals do not feel competent (Deci, 1975) or do not value the behavior itself (Ryan, 1995), amotivation is manifested. Ryan and Deci (2000) states that individuals with high level of amotivation do not possess any intention to act. Thus, even though no research has been found on the effects of implementation intention on amotivation toward electricity-saving, considering the aforementioned arguments, these may be possible reasons for the found non-significant effect of implementation intention.

Bandura (1997) states that individuals possess multifaceted and multidetermined functions which makes categorizing into a few stages too complicated. Further, DiClemente (1999) suggests that there are certain factors interfering process of change including belief systems, life situations, interpersonal conflicts and personal characteristics. To conclude, mentioned factors may be possible reasons for the found non-significant effect of readiness to change. However, as mentioned above, for a more concrete examination 5-dimensional version of the readiness to change needs to be applied on this subject.

### 4.4. Limitations and Suggestions for Future Studies

There are several limitations that can be discussed in this present thesis. It can be argued that the present number of participants can be considered as a limitation. Robinson and colleagues (2019) suggested that in order to achieve 80% power at $p = .05$ and an estimated effect size of $d = .63$, 32 participants per condition are required. Also, according to Mead's resource equation, in order to achieve 80% power at $p = .05$ the sample size should be at least 64 participants (Kish, 1965). Even though the mentioned criteria were met for each condition and the total number of participants, the distribution of participants to conditions was not equal. Because of the time interval between two phases of the study and the devastating earthquakes that happened on February 6, 2023, in several cities in Turkey, there were a total of 19 participants who did not complete the pre-measures. However, such dropouts were predicted at the beginning of the study and therefore more than the required number of participants were reached. Vanhove (2015) argues that when the participants are evenly distributed across different conditions, there is a higher chance of finding systematic differences and even though for mean comparison such uneven distribution does not cause any problems, for more complex designs such as factorial design this can cause certain limitations. For future studies, similar studies with equally distributed conditions (experimental and conditions) should be conducted.

Another limitation of this present thesis is the lack of measurements between pre and post-measures. Robinson and colleagues (2019) argue that more frequent measures can be

more beneficial to assess the fluctuations of construct in varying goal achievements. Thus, different measures can be included within pre and most measures for future studies.

A further limitation is based on the fact that both pre and post-measures of this study were conducted online using Qualtrics instead of a laboratory setting. The reason behind this decision was to reach a larger sample size with the lack of funding. Raghavendra and colleagues (2013) define delivery interventions as practical method for increasing participation and there is several research using the internet delivery interventions for environmental behaviors (Bell et al., 2015; Foster et al., 2010). However, one of the important factors influencing the effectiveness of implementation intention is participants' re-writing of their selected critical situations and matched strategies (Tekeş, 2018). Even though such re-writing was included in the Volitional Help Sheet created on Qualtrics whether participants copy and paste their selections or re-write them cannot be distinguished. For future studies, in order to eliminate the mentioned limitation laboratory settings should be preferred.

It is argued that assessment of the actual behavior is crucial for scientific analysis and in order to adequately evaluate the effectiveness of intervention methods assessment of the target behavior is needed (Lange & Dewitte, 2019). Some scholars discuss the validity of self-report measures for pro-environmental behaviors (Gifford, 2014; Lange et al., 2018). Most common questioned problems associated with self-report measures include differences between participants' possible understanding of the terms both in the questions and both in the Likert types (Kormos & Gifford, 2014). Also, repeated self-report assessments are discussed to increase the survey's accuracy (Kaiser et al., 2001). Further, Milfont (2009) emphasizes that participants cannot be impartial observers of their own behaviors. Since the present thesis only included self-report measures mentioned factors can be defined as other limitations. Therefore, research with direct behavioral measures including evidence regarding energy consumption such as electricity bills is needed.

In addition, the social desirability bias of the self-reported measures is argued to be a significant factor for research (Arnold & Feldman, 1981). Some scholars state that social desirability bias only occurs when sensitive topics such as sexual or drug-related behaviors are under examination (Carpenter, 2009). However, there is various research with higher education samples revealing that perceptions of institutional values, major satisfaction, value commitment, goal orientation and self-reported gains have a relationship with social desirability bias (Bowman & Hill, in press; Ferrari & Cowman, 2004; Ferrari, et al., 2009; Nauta, 2007). Considering the fact that the majority of this research sample consists of higher

education students and used self-report measures are from a pro-environmental context, self-report measures can be considered as another limitation for this present thesis.

Addedly, there are certain limitations of implementation intention interventions in literature. Armitage (2007) argues that most implementation intentions research uses passive control groups. In other words, while experimental groups receive or form implementation intentions and asked to engage in certain behavioral change, control groups are not asked to do neither of them. In addition, Jackson and colleagues (2005, 2006) state that student-based samples may be more obedient to task demands and implementation intention interventions can be susceptible to them. Thus, since this present thesis included a passive control group and a student weighted sample research including active control group with more diverse sample should be conducted.

Along with these, some scholars argue that readiness to change algorithm may underestimate the motivational component of behavioral change (Herzog & Blagg, 2007). Further, the final discussed limitation of this present thesis is the preference of two-dimensional Transtheoretical Model. Even though there are several research using the same structure (Bell, et al., 2015; Polak, et al., 2023), the limitations occurring along with this is mentioned. Bell and colleagues (2015) argue that two-dimensional structures eliminate the opportunity to examine participants' change throughout every original stage. Therefore, future research with large samples examining every original stage of the Transtheoretical Model and comparison with other motivational measures are needed.

## 4.5. Conclusion

In literature, there are several studies showing the effects of implementation intention and readiness for change on pro-environmental behaviors (Bamberg, 2000; Bell et al., 2016; Rise et al., 2003) and implementation intention (Gollwitzer, 1999) and readiness for change (Arden & Armitrage, 2008) are argued to be effective models for behavior change. Since there is not enough research on the impact of implementation intention and readiness for change on electricity-saving in adults, it was believed that this study had the potential to contribute significantly to the literature in this field and the findings obtained here could make important contributions to the literature. In addition, since there has yet been no study conducted on this topic in Turkey, it was thought that this study could contribute to both national literature and policy development. Furthermore, it was believed that the findings obtained could be useful in developing new intervention methods for climate change and global warming. Therefore, the main aim of this study was to investigate the impact of

implementation intention and readiness for change on participants' attitude, motivation and behavior toward electricity-saving.

When the effect of implementation intention was examined, contrary to expected, the results revealed that implementation intention only influenced external motivation. The possible reasons for this are as follows; there are certain factors influencing individuals' attitude, motivation and behavior toward electricity-saving which were not examined under the scope of this thesis. Further, no research has yet been found that examined attitude, motivation and behavior as separate factors in the context of implementation intention and readiness to change. Considering these, this present thesis is argued to have a significant importance on this matter.

Addedly, when the effect of readiness to change was examined, the results revealed that readiness to change had a significant effect on behavior, eco-management behavior, motivation, self-determined motivation, introjected motivation. The findings of this present thesis showed that the significant effects of readiness to change were more dominant. One of the possible reasons for this can be the wide range of factors influencing readiness to change and the fact that implementation intention is an intervention model targeting goal intentions. Thus, the dominant effect of readiness to change was not unexpected.

Last but not least, it was observed that the interaction between time, implementation intention and readiness to change had an effect on persuasion behavior which is participants' efforts to convince their friends and family to engage in electricity-saving behavior. This result showed the effectiveness of implementation intention paired with readiness to change and the effect of implementation intention increases when implemented to individuals in action stage of change. These results highlight the importance of individuals' stage of change in terms of effectiveness of implementation intention. For future studies and practical implications, before providing implementation intention intervention, individuals' transition to action stage from contemplation stage can be procured.

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# APPENDICES

## APPENDIX 1: INFORMED CONSENT FORM

Sayın Katılımcı,

Bu çalışma Deniz Akdeniz tarafından, Başkent Üniversitesi Sosyal Psikoloji Yüksek Lisans Programı bitirme tezi kapsamında Doç. Dr. Burcu Tekeş Tolungüç danışmanlığında yürütülmektedir. Çalışmanın amacı, bireylerin elektrik tüketimleri hakkında bilgi edinmektir. Çalışmamızın birkaç basamağı bulunmaktadır. Sizden topladığımız verileri kullanabilmemiz için bu basamakların tümüne katılmanız gerekmektedir. Araştırmanın tüm basamaklarının, katılımcıların fazla zamanını almayacak şekilde hazırlanmasına özen gösterilmiştir. Araştırmanın bu basamağının 15 dakika sürmesi beklenmektedir.

Çalışma boyunca karşınıza çıkacak soruların doğru ya da yanlış bir cevabı yoktur. Çalışma süresince istediğiniz noktada çalışmayı bırakabilirsiniz ve bu durumda verileriniz analize dahil edilmez. Çalışmada elde edilen tüm veriler anonimleştirilerek yalnızca bilimsel amaçlarla kullanılacaktır.

Çalışma hakkında daha fazla bilgi edinmek isterseniz Deniz Akdeniz'e ulaşabilirsiniz.

Katılımınız için teşekkür ederiz.

( ) Çalışmaya katılmayı onaylıyorum.

## APPENDIX 2: NICKNAME AND E-MAIL ADDRESSES

Bu araştırma toplamda 3 farklı aşamadan oluşmaktadır. İlerleyen aşamalar için sizinle iletişim kurabilmemiz adına lütfen aşağıda verilen alanlara belirleyeceğiniz bir rumuzu ve en sık kullandığınız e-posta adresinizi eksiksiz bir şekilde yazınız.

Rumuzunu soyisminizin ilk iki harfi ve doğdunuz gün ve ayı birleştirerek oluşturabilirsiniz.

AKMAN, 5 Mayıs

Örnek: Ak0505

Rumuzunuz:

E-posta Adresiniz:

## APPENDIX 3: THE ATTITUDE TOWARDS ENERGY CONSERVATION SCALE

Lütfen aşağıda verilen her bir maddeyi dikkatlice okuyunuz ve size en yakın gelen seçeneği işaretleyiniz. Soruların doğru ya da yanlış bir cevabı yoktur.

| | Kesinlikle katılmıyorum | Katılmıyorum | Kararsızım | Katılıyorum | Kesinlikle katılıyorum |
|---|---|---|---|---|---|
| 1. Elektrik tasarrufu yapmak bir çok güçlük içeriyor. | | | | | |
| 2. Elektrik tasarrufu yapmak çok fazla zamanımı alıyor. | | | | | |
| 3. Elektrik tasarrufu yaptığım zaman yaşam kalitem azalacaktır. | | | | | |
| 4. Elektrik tasarrufu yapmak, yaşam konforumu azaltmam gerektiği anlamına geliyor. | | | | | |

## APPENDIX 4: ENERGY CONSERVATION BEHAVIOR SCALE

Aşağıda enerji tasarrufu ve tüketimi konusunda çeşitli durumlar yer almaktadır. Lütfen her bir maddeyi dikkatlice okuyunuz ve hangi sıklıkla verilen davranışları gerçekleştirdiğinizi işaretleyiniz. Soruların doğru ya da yanlış bir cevabı yoktur.

| | Hiçbir zaman | Nadiren | Bazen | Sıklıkla | Her zaman |
|---|---|---|---|---|---|
| 1. Suyu tasarruflu kullanırım. | | | | | |
| 2. Ailemi enerji verimliliği yüksek ev aletleri almaları konusunda teşvik ederim. | | | | | |
| 3. Gereksiz yere yanan lambaları kapatırım. | | | | | |
| 4. Enerji tasarrufu için ailemi/ ev arkadaşlarımı/ yurt yönetimini damlayan sıcak su musluğunu tamir etmeleri konusunda teşvik ederim | | | | | |
| 5. Gereksiz yere takılı olan fişleri prizden çekerim. | | | | | |
| 6. Enerji tasarrufu yapmaları için ailemi/ ev arkadaşlarımı/ yurt yönetimini geceleri kombinin / kaloriferin ısısını düşürmeleri için teşvik ederim. | | | | | |
| 7. Enerji tasarruflu kompakt floresan ampuller almaları konusunda ailemi/ev arkadaşlarımı/ yurt yönetimini teşvik ederim. | | | | | |
| 8. Çamaşır ve bulaşık makinesini çalıştırmak için tamamen dolmasını beklerim. | | | | | |
| 9. Bilgisayarı kullanmadığımda kapatırım. | | | | | |
| 10. İşim bittiğinde elektrikli aletlerin fişini çekerim. | | | | | |
| 11. Dişlerimi fırçalarken suyu kullanmadığım sırada musluğu kapatırım. | | | | | |
| 12. Ailemi çamaşır makinesini düşük sıcaklıkta ve ön yıkamasız çalıştırmaları konusunda teşvik ederim. | | | | | |
| 13. Kullanmadığım zamanlarda TV, DVD oynatıcı gibi elektrikli cihazları düğmesinden kapatırım | | | | | |

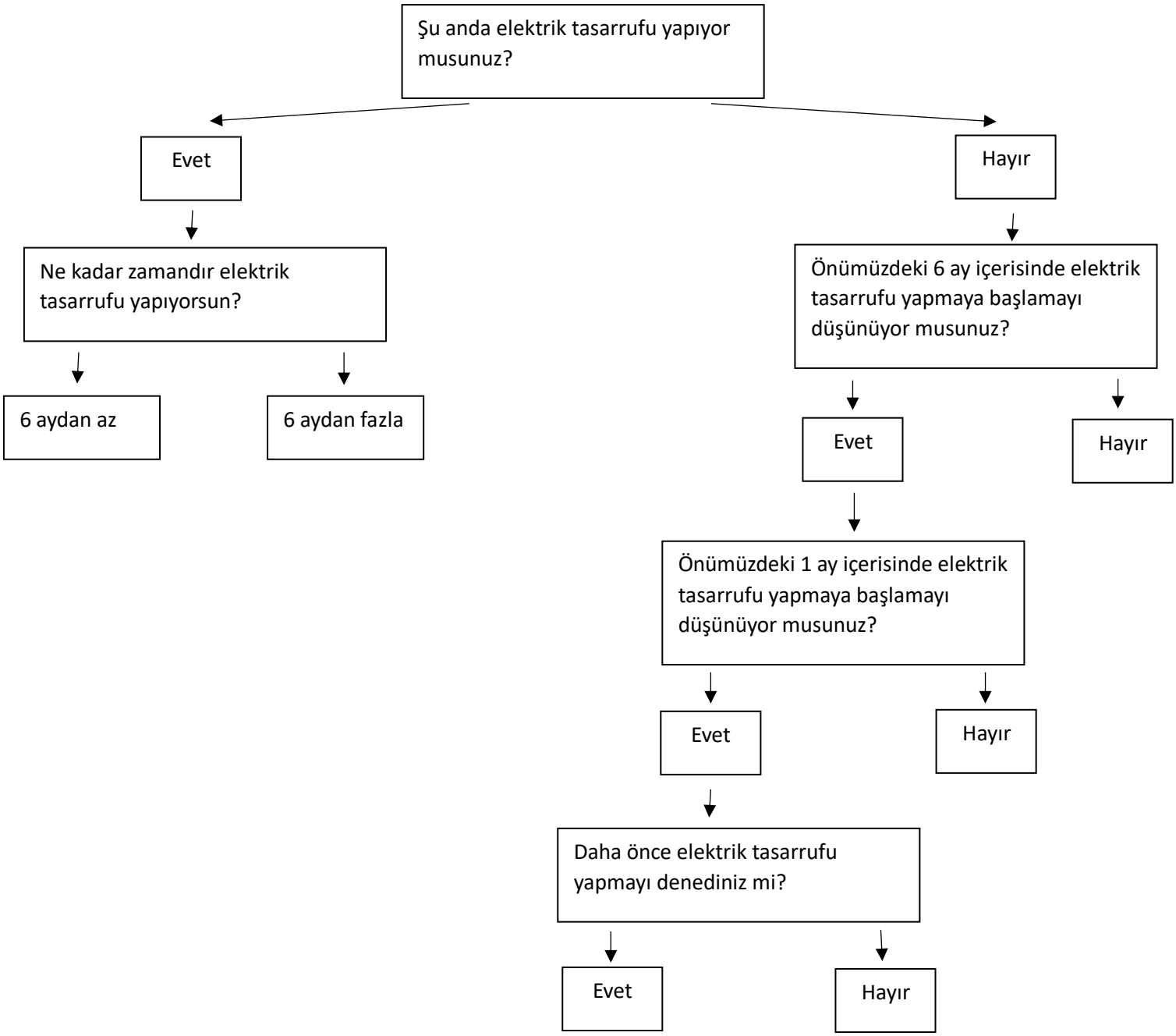
## APPENDIX 5: MOTIVATION TOWARDS ENERGY CONSERVATION

Aşağıda enerji tasarrufu ve tüketimi konusunda çeşitli durumlar yer almaktadır. Lütfen her bir maddeyi dikkatlice okuyunuz ve ne ölçüde katıldığınızı işaretleyiniz. Soruların doğru ya da yanlış bir cevabı yoktur.

| | Kesinlikle katılmıyorum | Katılmıyorum | Kararsızım | Katılıyorum | Kesinlikle katılıyorum |
|---|---|---|---|---|---|
| 1.Enerji tasarrufu yapmak akılcı bir davranıştır. | | | | | |
| 2. Enerji tasarrufu yapmak rutin davranışlarımdan birisidir. | | | | | |
| 3. Ailemin ısrarı ile enerji tasarrufu yaparım. | | | | | |
| 4. Enerji tasarrufu ile ilgili bir şeyler yapmasaydım pişman olurdum. | | | | | |
| 5. Enerji tasarrufu yaparak gelecek nesillerin daha iyi bir çevreye sahip olmalarına yardımcı oluyorum. | | | | | |
| 6. Enerji tasarrufu konusunda önemli gelişmeler kaydedilmezken, enerji tasarrufu yapmak bana anlamlı gelmiyor. | | | | | |
| 7. Enerji tasarrufuna katkıda bulunmaktan keyıf duyarım. | | | | | |
| 8. Enerji tasarrufu yaparken boşuna zaman harcıyormuşum gibi bir izlenime kapılıyorum. | | | | | |
| 9. Enerji tasarrufu yaparak çevre kalitesinin artmasına katkı sağlamak hoşuma gider. | | | | | |
| 10. Enerji tasarrufu yapmasaydım kendimi suçlu hissederdim. | | | | | |
| 11. Eleştirilmekten kaçındığım için enerji tasarrufu yaparım. | | | | | |
| 12. Enerji tasarrufu yaparak çevre kirliliğinin azalmasına yardımcı olurum. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 13. Enerji tasarrufu yapmasaydım kendimi kötü hissederdim. | | | | | |
| 14. Enerji tasarrufu yaparak bütçeme katkıda bulunurum. | | | | | |
| 15. Enerji tasarrufu için bir şeyler yapmasaydım huzursuz olurdum. | | | | | |
| 16. Takdir edilmek için enerji tasarrufu yaparım. | | | | | |
| 17. Yaşam anlayışımın doğası gereği enerji tasarrufu yaparım. | | | | | |
| 18. Enerji tasarrufu ile ilgili bir şeyler yapmanın iyi bir fikir olduğunu düşünüyorum. | | | | | |
| 19. Enerji tasarrufu yapmak yaşam tarzımın bir parçasıdır. | | | | | |
| 20. Enerji tasarrufu ıcın bır şeyler yapmış olmanın verdiği duyguyu severim. | | | | | |
| 21. Enerji tasarrufu yaparak çevreye nasıl yardımcı olacağımı anlamıyorum. | | | | | |
| 22. Çevremdeki insanların ısrarı ile enerji tasarrufu yaparım. | | | | | |
| 23. Enerji tasarrufu yapmanın bütçeme nasıl bir katkı sağladığını bilmiyorum. | | | | | |
| 24. Enerji tasarrufu yapmak yaşamımın tamamlayıcı bir parçasıdır. | | | | | |
| 25. Enerji tasarrufu yapmak mantıklı bir şeydir. | | | | | |
| 26. Enerji ham maddeleri hızla tüketilirken, bireysel yaptığım enerji tasarrufunun çevreyi iyileştireceğine inanmıyorum. | | | | | |

## APPENDIX 6: STAGES OF CHANGE ALGORITHM SCALE



## APPENDIX 7: VOLITIONAL HELP SHEET – EXPERIMENTAL GROUP

Bazen kişilerin elektrik tüketimlerini azaltma niyeti olsa da cezbedici durumlar karşısında gereksiz tüketimde bulunabilirler. Ancak, cezbedici durumlar karşısında bazı stratejiler uygulandığında, kişilerin bu durumlarla baş etmelerinin daha kolay olduğu bilinmektedir. Aşağıda elektrik tüketim miktarınızı azaltırken karşılaşabileceğiniz **10 farklı cezbedici durum** ve bu durumlarda uygulayabileceğiniz **10 farklı strateji** yer almaktadır.
Sizden bu iki liste içinden toplamda 5 eşleştirme yapmanızı isteyeceğiz.
Bu eşleştirmeler şu şekilde yapılmalıdır:
- Soldaki **cezbedici durumlar** içinden herhangi bir durum seçiniz. Daha sonra **stratejiler** sütunundaki cümleler içinden "bu durumda ne yapmak sizin için en uygun olurdu" diye düşünerek, verilen cümlecikler içinden en uygun gördüğünüzü seçip bu iki cümleciği eşleştiriniz ve aşağıda belirtilmiş olan boşluklara yazınız.
- Toplamda beş eşleştirme yapmanız beklenmektedir.

| Cezbedici durumlar | Stratejiler |
|---|---|
| 1. Bir odanın ışığının açık olduğunu fark ettiğimde açık bırakmak daha cazip gelirse, | 1. O zaman elektrik tasarrufu yapma konusunda kendime verdiğim sözü hatırlayacağım. |
| 2. Şarjı dolmuş olsa bile elektronik cihazlarımı şarjda bırakmak daha cazip gelirse, | 2. O zaman küresel ısınma ve iklim değişikliğinin dünyamıza verdiği zararları hatırlayacağım. |
| 3. Odadan / evden çıkarken ışığı açık bırakmak daha cazip gelirse, | 3. O zaman bireysel adımların dünyamızı korumadaki önemini hatırlayacağım. |
| 4. İzlemem bittiğinde televizyonu açık bırakmak daha cazip gelirse, | 4. O zaman az elektrik tüketmenin önemini hatırlayacağım. |
| 5. Tasarruflu ampül yerine normal ampül kullanmak daha cazip gelirse, | 5. O zaman gereksiz elektrik tüketmezsem doğaya zarar vermeyen biri olacağımı hatırlayacağım. |

| | |
|---|---|
| 6. Kullanmadığım zamanlarda buzdolabını açık bırakmak daha cazip gelirse, | 6. O zaman çevre yanlısı davranışlarda bulunmanın benim için önemini hatırlayacağım. |
| 7. Kullanmadığım zamanlarda bilgisayarımı açık bırakmak daha cazip gelirse, | 7. O zaman fazla elektrik tüketiminin yarattığı sonuçları hatırlayacağım. |
| 8. Kullanmadığım elektronik eşyaları prizde bırakmak daha cazip gelirse, | 8. O zaman gereksiz elektrik tüketmenin kendimi düşünceli bir insan olarak görmemle çeliştiğini hatırlayacağım. |
| 9. Çamaşır veya bulaşık makinesini tam dolmadan çalıştırmak daha cazip gelirse, | 9. O zaman çevremdeki insanlardan (Elektrik tasarrufu veya çevre yanlısı davranışlar konusunda daha tecrübeli olanlardan) gelecekte bu tarz durumlarda gereksiz elektrik tüketimi yapmaktan nasıl kaçınacağım konusunda bilgi alacağım. |
| 10. Klima açıkken camları açık bırakmak daha cazip gelirse, | 10. O zaman gereksiz elektrik harcamayan, çevre konusunda duyarlı biri olduğumu kendime hatırlatacağım. |

Lütfen yukarıda verilen tabloda yapmış olduğunuz eşleştirmeleri yazınız.

| **Cezbedici Durumlar** | **Stratejiler** |
|---|---|
| | |
| | |
| | |
| | |
| | |

## APPENDIX 8: VOLITIONAL HELP SHEET – CONTROL GROUP

Aşağıda günlük hayatınızda farklı koşullarda karşınıza çıkabilecek **10 farklı durum** ve bu durumlarda uygulayabileceğiniz **10 farklı strateji** yer almaktadır.
Sizden bu iki liste içinden toplamda 5 eşleştirme yapmanızı isteyeceğiz. Bu eşleştirmeler şu şekilde yapılmalıdır:

- Soldaki **cezbedici durumlar** içinden herhangi bir durum seçiniz. Daha sonra **stratejiler** sütunundaki cümleler içinden "bu durumda ne yapmak sizin için en uygun olurdu" diye düşünerek, verilen cümlecikler içinden en uygun gördüğünüzü seçip bu iki cümleciği eşleştiriniz ve aşağıda belirtilmiş olan boşluklara yazınız.
- Toplamda beş eşleştirme yapmanız beklenmektedir.

| Durumlar | Stratejiler |
|---|---|
| 1. Arkadaşım kitabımı geri getirirse, | 1. O zaman hafta sonu tiyatroya gidebilirim. |
| 2. Bu kadar çok kahve içersem, | 2. O zaman bu yıl mezun olabilirim. |
| 3. Gökyüzünde gri bulutlar görürsem, | 3. O zaman uyumakta zorluk çekerim. |
| 4. O metroyu kaçırırsam, | 4. O zaman sana ödünç verebilirim. |
| 5. Biraz para biriktirebilirsem, | 5. O zaman yanıma şemsiye alırım. |
| 6. İş teklifini kabul edersem, | 6. O zaman taksi tutmam gerekir. |
| 7. Derslerime yeterince zaman ayırırsam, | 7. O zaman pikniği iptal etmemiz gerekir. |
| 8. İşlerimi bugün bitirebilirsem, | 8. O zaman ortalamamı yükseltebilirim. |
| 9. Hafta sonu yağmur yağarsa, | 9. O zaman hafta sonu tiyatroya gidebilirim. |

| | |
|---|---|
| 10. Bu dönem o dersi alabilirsem, | 10. O zaman yüksek lisans yapabilirim. |

Lütfen yukarıda verilen tabloda yapmış olduğunuz eşleştirmeleri yazınız.

| **Durumlar** | **Stratejiler** |
|---|---|
| | |
| | |
| | |
| | |
| | |

## APPENDIX 9: DEMOGRAPHIC INFORMATION FORM

**Yaşınız:**

**Medeni durumunuz:**

( ) Bekar

( ) İlişkisi var

( ) Evli

( ) Boşanmış

**Mesleğiniz:**

**En son mezun olduğunuz okul:**

( ) İlkokul

( ) Ortaokul

( ) Lise

( ) Üniversite

( ) Yüksek Lisans

( ) Doktora

**Eve giren aylık toplam gelir:**

**Çalışma durumunuz:**

( ) Öğrenci

( ) Çalışmıyor

( ) Yarı zamanlı çalışıyor

( ) Tam zamanlı çalışıyor

**Çalışıyor iseniz, çalışma biçiminiz:**

( ) İş yerinden

( ) Evden

( ) Hibrit (Bazı günler iş yerinden, bazı günler evden)

Lütfen haftada kaç gün evden çalıştığınızı belirtiniz:

**Öğrenci iseniz, derslerin yürütülme biçimi:**

( ) Yüz yüze

( ) Evden

( ) Hibrit (Bazı dersler evden, bazı dersler yüz yüze)

Lütfen haftada kaç gün evden dersinizin olduğunu belirtiniz:

**Yaşadığınız evde siz hariç yaşayan toplam kişi sayısı:**

**Yaşadığınız evde sizin dışınızdaki bireylerin çalışma ve öğrencilik durumları** (Lütfen her bir bireyi ayrı ayrı yazınız):

Örnek: 1. kişi öğrenci, 2. kişi tam zamanlı çalışıyor.

**Yaşadığınız evde sizin dışınızdaki bireylerin çalışma ve derslerinin yürütülme biçimleri** (Lütfen her bir bireyi ayrı ayrı yazınız):

Örnek: 1. kişi evden çalışıyor, 2. kişi hibrit okuyor

**Eğer hibrit çalışma veya öğrenim durumunda bireyler varse, lütfen her birinin haftada kaç gün evden çalıştığını veya dersinin olduğunu yazınız.** Hibrit çalışan veya öğrenci kimse yoksa "Yok" yazmanız yeterli:

**Yaşadığınız evde bulunan toplam cep telefonu sayısı:**

**Yaşadığınız evde bulunan toplam bilgisayar sayısı:**

**Yaşadığınız evde bulunan toplam tablet sayısı:**

**Yaşadığınız evde bulunan toplam televizyon sayısı:**

**Yaşadığınız evde bulunan toplam beyaz eşya sayısı ve türleri** (Buzdolabı, çamaşır makinası gibi):

Örnek: 1 buzdolabı, 2 çamaşır makinası

**Yaşadığınız evde bulunan diğer elektronik cihazlar ve sayıları:**

## APPENDIX 10: DEBRIEF

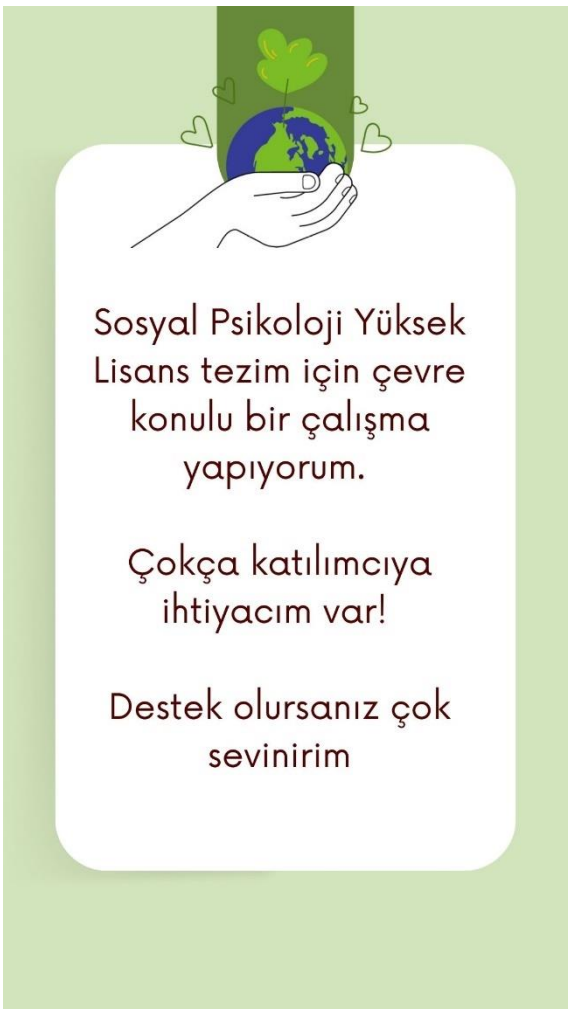
Değerli katılımcı,

Çalışmanın son aşamasını tamamladınız, katılımınız için teşekkür ederiz.

Bu çalışma bireylerin enerji tasarrufuna yönelik tutumları, enerji tasarrufu davranışları ve enerji tasarrufuna yönelik motivasyonları hakkında bilgi almak amacıyla gerçekleştirilmiştir.

Çalışma hakkında daha fazla bilgi almak için Deniz Akdeniz'e ulaşabilirsiniz.

**APPENDIX 11: SOCIAL MEDIA ANNOUCEMENTS**




Başkent Üniversitesi Sosyal Psikoloji Yüksel Lisans tezim için çevre konulu bir çalışma yürütüyorum ve çokça katılımcıya ihtiyacım var. Çalışmaya katılarak veya paylaşarak destek olabilirseniz çok sevinirim.
baskentpsychology.eu.qualtrics.com/jfe/form/SV_55...

## APPENDIX 12: VOLITIONAL HELP SHEET EMAIL

Merhaba,

Araştırmanın ilk aşamasını tamamladınız, katılımınız için teşekkür ederiz. İkinci aşama için ortalama 10 dakikanızı alacak bir anket çalışmasına katılmanız istenmektedir. Aşağıda yer alan bağlantıdan sorulara ulaşabilirsiniz.

**ANKET BAĞLANTISI:**

Herhangi bir soru için her zaman bana ulaşabilirsiniz.

Sevgiler,

Deniz Akdeniz

## APPENDIX 13: POST-MEASURE EMAIL

Merhaba,

Çevre konulu tez çalışmamın son aşamasına hoş geldiniz. Bu zamana kadarki emekleriniz ve katılımınız için teşekkür ederim.

Son aşama için aşağıda yer alan bağlantıdan en fazla 10 dakikanızı alacak anketi doldurmanız gerekmektedir.

https://baskentpsychology.eu.qualtrics.com/jfe/form/SV_a5j2jDSXtzkfQhw

Tüm sorularınız için her zaman bana ulaşabilirsiniz.

Desteğiniz her zaman çok kıymetli.

Sevgiler,

Deniz Akdeniz

## APPENDIX 14: BASKENT UNIVERSITY INSTITUTIONAL REVIEW BOARD APPROVAL

Evrak Tarih ve Sayısı: 22.04.2022-121819

1993
**BAŞKENT ÜNİVERSİTESİ**
**Akademik Değerlendirme Koordinatörlüğü**

Sayı : E-62310886-605.99-121819
Konu : Deniz Akdeniz'in Etik Onay Başvurusu Hk. 22.04.2022

SOSYAL BİLİMLER ENSTİTÜSÜ MÜDÜRLÜĞÜNE

İlgi : 11.04.2022 tarih ve 118160 sayılı yazınız.

Enstitünüz Sosyal Psikoloji Tezli Yüksek Lisans Programı öğrencisi Deniz Akdeniz'in, Dr. Öğretim Üyesi Burcu Tekeş Tolungüç'ün danışmanlığında yürüteceği "Enerji Tüketimi Bağlamında Elektrik Tasarrufunun Artırılmasına Yönelik Bir Müdahale: Niyet Aşılama ve Transteoretik Model" başlıklı yüksek lisans tez çalışması değerlendirilmiş ve bilgilerinize ekte sunulmuştur.

Prof. Dr. M. Abdülkadir VAROGLU
Kurul Başkanı

Ek: Değerlendirme Formu

Bu belge, güvenli elektronik imza ile imzalanmıştır.

Belge Doğrulama Kodu :II594V4KYR4 Belge Doğrulama Adresi : https://www.turkiye.gov.tr/baskent-universitesi-ebys

Başkent Üniversitesi Bağlıca Kampüsü Fatih Sultan Mahallesi Eskişehir Yolu 18. Km 06790
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Kep Adresi:baskentuniversitesi@hs02.kep.tr

Bilgi için: Gamze SONBAY
Koordinatör
Telefon No: 246 66 66 / 2078

Sayı : 17162298.600-108
Konu : Tez Çalışması

15 NİSAN 2022

İlgili Makama

Üniversitemiz Sosyal Bilimler Enstitüsü Sosyal Psikoloji Tezli Yüksek Lisans Programı öğrencisi Deniz Akdeniz'in, Dr. Öğretim Üyesi Burcu Tekeş Tolungüç'ün danışmanlığında yürüteceği "Enerji Tüketimi Bağlamında Elektrik Tasarrufunun Artırılmasına Yönelik Bir Müdahale: Niyet Aşılama ve Transteoretik Model" başlıklı yüksek lisans tez çalışması değerlendirilmiş ve yapılmasında bir sakınca olmadığı tespit edilmiştir.
Bilgilerinize saygılarımızla sunarız.

Başkent Üniversitesi Sosyal ve Beşeri Bilimler ve Sanat Araştırma Kurulu

| Ad, Soyad | Değerlendirme | İmza |
|---|---|---|
| Prof. Dr. M. Abdülkadir Varoğlu | Olumlu/Olumsuz | |
| Prof. Dr. Kudret Güven | Olumlu/~~Olumsuz~~ | |
| Prof. Ali Sevgi | Olumlu/Olumsuz | |
| Prof. Dr. Işıl Bulut | Olumlu/Olumsuz | |
| Prof. Dr. Sadegül Akbaba Altun | Olumlu/~~Olumsuz~~ | |
| Prof. Dr. Can Mehmet Hersek | Olumlu/~~Olumsuz~~ | |
| Prof. Dr. Özcan Yağcı | Olumlu/~~Olumsuz~~ | |

Prof. Dr. Sadegül Akbaba Altun, Üniversitemiz Sosyal Bilimler Enstitüsü Sosyal Psikoloji Tezli Yüksek Lisans Programı öğrencisi Deniz Akdeniz'in, Dr. Öğr. Üyesi Burcu Tekeş Tolungüç'ün danışmanlığında yürüteceği "Enerji Tüketimi Bağlamında Elektrik Tasarrufunun Artırılmasına Yönelik Bir Müdahale: Niyet Aşılama ve Transteoretik Model" başlıklı yüksek lisans tez çalışmasının yapılabileceği; ancak adaptasyonu yapılacak ölçeklerin sahiplerinden izin alınması gerektiği görüşündeler.

Prof. Dr. Özcan Yağcı, Sosyal Bilimler Enstitüsü Sosyal Psikoloji Tezli Yüksek Lisans Programı öğrencisi Deniz Akdeniz'in, Dr. Öğr. Üyesi Burcu Tekeş Tolungüç'ün danışmanlığında yürüteceği "Enerji Tüketimi Bağlamında Elektrik Tasarrufunun Artırılmasına Yönelik Bir Müdahale: Niyet Aşılama ve Transteoretik Model" başlıklı yüksek lisans tez çalışmasının uygun olduğu düşüncelerini iletmişlerdir.