HETEROGENEOUSLY INFORMED GROUP DECISION MAKING UNDER EXPERT ADVICE

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ABSTRACT

HETEROGENEOUSLY INFORMED GROUP DECISION MAKING UNDER EXPERT ADVICE

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Decision processes may be completed individually or coordinated by groups of people. Unstructured group decision making have its very own dynamics which are different than the processes completed individually. This thesis aims to extend the accumulation of knowledge on group decision processes. An experiment with three setting will be used to reveal advice utilization and confidence characteristics in a group receiving advice. All of the settings are composed of an individual decision making step and a group decision making step as a group of three. The same set of twenty general knowledge questions on a wide range of topics will be answered on both steps and for all Settings. On Setting 1, the participants will receive no advice on neither individual nor group decision making steps. On Setting 2, the participants will receive advice for only group decision making step. And on Setting 3 the participants will receive advice for only individual decision making step.

Keywords: Advice taking, Advice utilization, Confidence, Group decision making.

ÖZ

UZMAN TAVSİYESİ ALTINDA HETEROJEN BİLGİLENDİRİLMİŞ GRUP KARAR VERMESİ

Özer, Nergiz

Yüksek Lisans, İşletme Bölümü

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Karar verme işlemleri bireysel olarak ya da bir grup insanın koordine olarak tamamlanmaktadır. Yapılandırılmamış grup karar mekanizmaları bireysel tamamlanan işlemlerden farklı olarak kendilerine has dinamiklere sahiptir. Bu tez, grup karar verme işlemlerindeki bilgi birikimini artırmayı hedeflemektedir. Üç ortamda yapılmış olan bir deney, grup karar verme işlemlerindeki öneri kullanımlarını ve güven karakteristiklerini açıklamaktadır. Tüm deney ortamları bir bireysel karar verme adımı ve üç kişilik grup içerisinde grup karar verme adımından oluşmaktadır. Aynı set içinde ve geniş bir yelpazede sunulan yirmi adet genel kültür sorusu, tüm ortamlarda her iki adımda da sorulmuştur. Ortam 1'de katılımcılar ne bireysel, ne de grup adımında öneri almamışlardır. Ortam 2'de katılımcılar sadece grup karar verme adımında öneri almışlardır. Ortam 3'te ise katılımcılar sadece bireysel karar verme adımında öneri almışlardır.

Anahtar Kelimeler: Öneri alma, Öneri kullanma, Güven, Grup karar verme.

To my parents

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CHAPTER I

INTRODUCTION

Decision process may be completed individually or in coordination with a group of people. Within complexity of modern life and diversity of required knowledge prior to making a decision, even if an individual is held responsible of a decision, consulting to others is inevitable. A doctor consulting colleagues about a diagnosis or a university graduate asking for opinions of parents about a job offer are common daily examples of advice giving/taking practices. Also frequently we make decisions and are responsible of the outcome as a group of people. A job interview jury is an example of working groups which is tasked with hiring most competent workers for an organization.

Within my thesis I focused on the question, “How heterogeneously informed groups make decisions under advice?” To answer that question I refer to advice giving/taking and group decision making literatures in a broad sense. This research question can be regarded as a composition of “How individuals make decisions while receiving advice,” and “How (small) groups make decisions?” Common aspects of both questions are “decision making”, so “How people (as individuals) make decisions?” is the main pillar. In coming parts of introduction and in literature review, answers and findings about those questions will be presented.

1.1. Decision Making

To investigate how groups make decisions, we should first explain what is group and what is decision making. Decision is defined as ‘a conclusion or resolution reached after consideration’ by Oxford Dictionary Online. To make a decision, one has to judge the condition they are in. Thus, judgement is starting point of this work and every step in human life. And judgement is defined as ‘the ability to make considered decisions or to come to sensible conclusions’ by Oxford Dictionary. If we define

judgement as process of evaluating information, decision comes to be the result of this process.

Economically rational decision maker model for human decision processes proposed to formulate how a customer should perceive utility/cost correlation. According to this model, a person will prefer the product with highest utility/cost ratio among all products of same family. This model does not take availability, liking, preference and limited resources or time into consideration. Thus it is not consistent with our routine decision making procedures. Simon (1982) concluded that we are “bounded rational” creatures thus we are bounded with our cognitive ability, resources and time. Our cognition shaped through evolution and resulted in a way that fastest survives.

Tversky and Kahneman (1974) focused on how bounded human minds can be misled due to single cue used for decision with the limited cognitive capacity. Three heuristics they determined, representativeness, availability and anchoring were non-compensatory strategies for concluding a course of action. Since those strategies were not competent for reaching the optimal solution, decisions that people concluded using those strategies were biased.

Later Gigerenzer and Todd (1999) named those fast decision strategies as “fast and frugal heuristics”. Heuristics on daily basis save time and effort for us replacing decision processes that otherwise could spend high cognitive effort such as deciding what to wear for work or which seat to take in cafeteria. With this perspective Gigerenzer and his colleagues (1999) specified minimalist, take-the-best and take-the-last strategies that we use in our daily lives.

Despite the fact that we employ a wide range of strategies for simple daily decisions, they fail to serve when complexity of the situation thus number of cues to consider is increased. Also accuracy of the solutions may be more important than their being “fast and frugal”. Those are the times that we form groups and combine our cognitive effort for higher accuracy of the outcome.

1.2. Group Decision Making

When a group of people is held responsible of a decision, different variables come to light. Even if every member of the group determined to employ same decision strategy, availability for example, different perception of available options and

interactions among people shape the conclusion they will arrive. Conformity pressure that members are exposed to make them agree with the group they are in even if the group judgement is wrong (Asch; 1952).

Generally aim of forming a group, or a work team in case of organizations, is to use diverse point of views or different expertise areas to shed light on tricky problems and increase effectiveness. Diversity in work teams is a double edged sword (Mannix & Neale; 2005). Improved problem solving capability expectation led by those groups may be interrupted due to free riding of a member or social conflict formed within groups (e.g., Besedes et al., 2014).

Another important factor determined to effect decision processes and outcome performance is structure of the decision making unit. Vroom and Yetton model describes this decision making within organizations into five distinct structures which ranges from individual decision making (namely Autocratic I) to unstructured group decision making (namely Group II). Within this classification JAS structure (namely Autocratic II, Consultative I and Consultative II) lies in between those two cases (Vroom & Yetton, 1973). This classification is important since later researchers found that unstructured groups and judge-advisor systems are differ from each other in terms of many procedural and outcome variables such as social pressures, responsibility felt for outcome and perception of information that group or individuals hold (Savadori et al. 2001; Van Swol, 2009; Van Swol & Ludutsky, 2007).

Sometimes information we hold is not sufficient to come up with a solution. Under those circumstances we ask for information or recommendations of others'. These practices are investigated within advice taking literature that I will refer in the coming section.

1.3. Advice Taking and Judge Advisor Systems

Taking advice, referring to opinions of others, is a common practice during decision making process. People seek – and pay for – advice with a variety of motives. According to Harvey and Fischer (1997) three important motives for accepting advice are improving decision quality, sharing responsibility of the outcome and reluctance for rejecting free advice. As individuals, we may feel weak in the face of complex real-life problems thus we seek existence of someone we trust and hope them to

protect us from consequences of wrong choices. Formation of groups in organizations for decision making processes proposed to also serve increasing accuracy of the final decisions.

Advice gathered from different sources has different importance levels or weights for people during the consolidation of advice. When your grandmother and an expert weather forecaster disagree about today it will rain or not, you will agree with your grandmother and take your umbrella with you since she holds the reward power for dinner. Van Swol and Sniezek (2005) presented important weighting variables people are affected by during the process. These are “judge’s trust in advisor, advisor’s confidence, advisor’s accuracy, judge’s prior relation with advisor and judge’s power to set payment to advisor” (Van Swol and Sniezek, 2005, Sniezek and Van Swol, 2001).

Utilization of advice and its measurement strategies widely researched within JAS literature. Formula-based measures to determine degree of utilization are “advice taking” (Harvey and Fischer, 1997), “weight of advice” (Yaniv, 2004b) and “weight of own estimate” (Yaniv and Kleinberger, 2000) being used.

Since generally aim of asking for advice is coming up with a good course of action and being sure about that course of action, outcomes of advice taking practices are accuracy of final decision and confidence rated for the decision. Just as the level of advice utilization, accuracy and confidence depends on many factors. Starting with accuracy, advice receivers are sensitive to accuracy of advice givers. If the task takes place within a timeline and feedback is present (Fischer & Harvey, 1999) or a pool of advice with outliers given, (Harries et al., 2004) judges learn and adjust their weighting to improve their final accuracy.

Confidence rated by advisors and judges are also have important interactions. Within the experimental designs where the only cue that judge can use for weighting advisors is confidence given by them; advisor confidence can be a useful tool to determine accuracy (Price & Stone, 2004) or a tool to manipulate judges towards advisors’ opinions (Van Swol, 2009).

1.4. Thesis Organization

Before finalizing a decision, people do many things. They search for information about alternatives through Web, ask for the opinion of a trusted one, and consolidate all data gathered using their own point of view. This process varies depending on importance and complication of the problem. Also a similar process can be held by groups which need to come up with a consensus decision/opinion. Members of the group put forward an idea about the issue, make research together or on their own and hopefully arrive at a satisfactory consensus decision.

Aim of this thesis is to understand how groups make consensus decisions under advice. Does the advice utilization and confidence rating change relative to JAS and unstructured groups? For this aim within Chapter 2 Literature review, I will first go through the individual decision making. Than a general review of advice taking with utilization, discounting and confidence concepts explained. Judge advisor systems and variables within the system are investigated. Group decision making, its dynamics and unstructured group versus JAS researched and information perception findings addressed.

In this work, three settings of experiment prepared relative to advice receiving structures. All participants answer twenty general knowledge questions about occurrence years of historic events happened within last hundred years first as individuals then as groups of three. Participants assigned to Setting 1 receive no advice during neither individual nor group decision making steps. This represents the baseline for the analysis within the experiment since it is the setting that has unstructured group decision making procedure as in the literature (e.g., Keyton, 1999; Savadori et al., 2001; Van Swol, 2009). Within Setting 2 and 3 advice is provided on group decision making step and individual decision making step respectively. This way two different JAS structure aimed to be employed, first with initial opinion (e.g., Harvey and Fischer, 1997; Yaniv, 2004b; Yaniv and Kleinberger, 2000) and without initial opinion (e.g. Harvey et al., 2000; Van Swol & Sniezek, 2005; Budescu et al., 2003).

Advice generated for Setting 2 and 3 using a randomization rule varying around real date of the event (Fischer & Harvey, 1999). For manipulating the participants with same amounts, mean absolute error of the advice given to Setting 2 “Question 1” is

equal to average of three advices' mean absolute error given to individuals in Setting 3 "Question 1". Average of advices' deviation from real date given to group also aimed to be as close as zero that overall accuracy of the advice comes to be expert level whereas on the question base, advices seems to be randomized and naïve (Özarslan, 2014).

Although acceptance of advice may reasonably vary among participants, they are told that advice is supplied by an expert to create the common perception about the advice. Using "expert" notation for advice prepared by experimenter used before mostly for researches aiming to determine differences occurring due to expert vs. non-expert advisor (Goldsmith & Fitch, 1997; Jungermann & Fischer, 2005).

Within chapter 3, Method the information specific to this work in terms of experiment design, procedure, participant profile and advice generated will be explained in detail. Chapter 4, Results covers the information obtained using advice utilization methods, statistical analysis and demographic structure analysis. Lastly chapter 5, Discussion and Further Research, findings are summarized together with possible reasoning behind them. Limitations of this research and future research opportunities are presented.

CHAPTER II

LITERATURE REVIEW

2.1. Individual Decision Making

Bounded rational human decision maker, as Herbert Simon (1956) described us, processes some cues from environment prior to making a decision. As can be seen on Figure 1, decision maker evaluates cues coming from the environment to understand the environment. An individual sitting in a room which is adequately warm (cue #1) and seeing sunlight coming from outside (cue #2) may conclude that outside is also adequately warm for sitting (YS). Those cue evaluation for concluding about environment is known as lens model by Brunswik (1955). According to this framework, rA is difference between outside temperature (YE) and guess of the individual. If we can measure the outside temperature and define a success measure for this judgement, we can also assess accuracy of that individual's judgement.

Our daily judgements like guessing outside temperature and wearing a coat or not is more of the simple procedures. Gigerenzer & Todd (1999) formulated some shortcuts we use as "fast and frugal heuristics". According to this classification, recognition, take the last, take the best are some of the strategies we use to evaluate cues and make our judgements. At this point, for simple decisions, being fast and frugal is more important than being 99.9% accurate. Thus these heuristic strategies do not have a feedback and control mechanism, in other words, this strategies are non-compensatory.

For more complex decisions we made for our lives and during our jobs, we form groups, we consult experts and employ some other strategies with feedback and control mechanisms embedded.

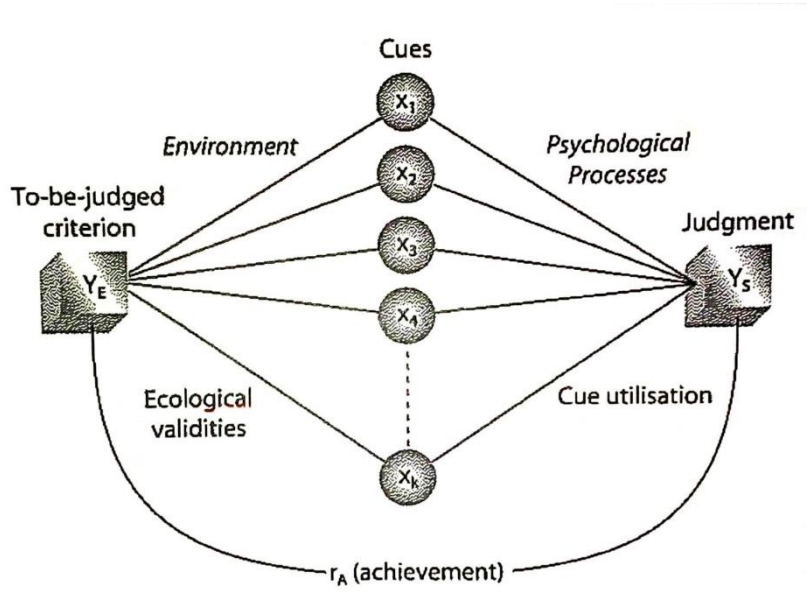

Figure 1 Brunswik's (1955) Lens Model of Decision Making (Adapted from "Judgment and decision making: Psychological perspectives" by Hardman, David, 2009, Blackwell Publishing, p.11)

2.2. Team Decision Making

Within an organization, decision making teams are mostly formed for hard-to-solve problems when inputs are vague or output is not a straightforward decision or quality of the output is hard to evaluate (Hart, 1985). In this case, a team can be described as a collection of more than one person for a collective aim. Team members are expected to exert effort to reach an optimally good course of action for the organization.

Considering working environment, work teams are expected to be more productive, more innovative, more accurate and more of all the positive outcomes for the firm. Since allocating more human resource to a task is an important cost, increase in efficiency is expected when compared to an individual (Festinger, 1954) assigned to same task. But number of people in the group/work team is not the only variable of efficiency. According to Hackman's (1987) "normative model of work team effectiveness", another very important variable is the level of individual effort exerted by each group member.

2.2.1. Homogenous vs. Heterogeneous groups

An important challenge in our life is making a decision as a part of a group of people. As a part of our family, as a teamwork-spirited employee, or as a cohesive friend group, what is expected from us is being an active participant and work for group outcomes. We, as individuals, feel comfortable around and want to be with individuals who are similar to us. This similarity seeking may be by political views, demographic level or simply by soccer team supported. Mannix and Neale (2005) made a broad definition of diversity that it can be expressed by any attribute that people define themselves and identify pool of similar and different people (e.g., Jackson, 1992). With this perspective we feel diversity within teams hard to handle (Ilgen, 1999; Ely & Thomas 2001).

Mannix and Neale (2005) reported many advantages and disadvantages of diversity. Diversity in work teams found to be creating a wider perspective of ideas to be discussed which is mostly beneficial for innovation and problem solving cases (e.g. Sommers, 2006). But at the same time diversity in terms of social and demographic factors may reduce group cohesiveness and create social divisions which may result in poor performance. As a parallel point of view, homogeneous groups of people tend to process information on more extreme ends than individuals (Myers & Lamm, 1976; Isenberg, 1986; Sunstein & Hastie, 2008).

Also task dependent knowledge can be a tool to imply diversity between group members. Risky-choice framing researches are held by several works and findings are contradictory. Neale and his colleagues (1986) indicated that framing effect is reduced in group decision making whereas Paese and his colleagues (1993) found increased framing at two of four decision tasks for homogenous groups. Another research by Milch and his colleagues (2009) ascertain no increase or decrease of framing in group decision making when compared to individual decision making. Also Yaniv (2011) investigated behaviours of four member groups using framing paradigm of Kahneman and Tversky (1984). Before forming groups, individuals are framed for “pay” and “save” tuition and participants are asked to rate risky or risk-free options in their conditions. Groups composed of differently framed participants - heterogeneous - show nearly no framing effect whereas homogenous groups showed higher framing effect at their post-discussion choices when compared to individuals.

2.2.2. Group Size

By definition, small group is a collection of at least two people for a common goal or purpose (Mills, 1967, p.2). Goals of these groups may vary widely. Within organizational research, focus is how decision-making groups are organized and as a link to their size, how does group size affect decision outcomes (i.e. group productivity; Steiner, 1972). Everyday examples of organizational decision making groups can be a board of directors or job interview jury.

Bray and his colleagues (1978) conceptualized functional size as a measurement of performance for small groups. They worked with 2, 3, 6 and 10 member groups and determined that as group size increases functional size, number of participants exerting effort on the task, decreases (Stephan & Mishler, 1952). This performance loss later explained using social concepts as “social loafing” and “free riding” (Latane, Williams & Harkins, 1979; Karau & Williams, 1993).

A later work by Boje and Muringhan (1982) worked with 3, 7 and 11 member groups and on the contrary to findings of Bray and his colleagues (1978), they stated “neither accuracy nor confidence” of the groups were dependent to group size.

2.2.3. Social effects

When performance of groups is under investigation, concept of “social loafing” and “free riding” are very important concepts (Latane, Williams & Harkins, 1979; Karau & Williams, 1993). Social loafing is defined as, people may reduce their effort when they are a part of a group compared to their individual effort. Free riding on the contrary, occurs when a member takes all the responsibility for the group outcome. Besedes and his colleagues (2014) states that “altruism, social pressures, shared responsibility, social identity, and group salience” can be collectively expressed as social responsibility effect of group membership and past research stated that has increasing effect to exerted effort (e.g. Charness, Rigotti and Rustichini 2007).

Besedes and his colleagues (2014) concluded that interacting groups which share group outcomes perform better and exert more effort when compared to non-interacting groups with shared outcomes and individuals. Also it is supported that group salience improves group performance (Charness, Rigotti & Rustichini, 2007; Sutter, 2009; Besedes et al., 2014).

Sniezek and Henry (1990) revealed another important factor about group decision making. Their work made up the conclusion that high commitment to the group is leading to high confidence in group decision. Harmon and Rohrbaugh (1990) captured a similar frame, also. Groups receiving full feedback and reduced feedback about “handicapping judgements about race horses” were examined. Groups with full feedback, since they had opportunity to explicitly discuss their disagreements with other members, resulted in a more committed state.

2.2.4. Judge-Advisor Systems vs. unstructured groups

Another determinant of group performance is structure of the group. Organizations mostly have distinct and hierarchical job descriptions for workers. Even if a decision making group is formed as a mixture of hierarchical levels, members act according to their pre-assigned statuses. If a work team structured such that a leader or manager have the decision responsibility and a number of subordinates are at the position of reporters or supporters, this is named as “Judge-Advisor Systems” (Sniezek & Buckley, 1995), and will be explicitly described within coming parts. If the work team composed of individuals at the same hierarchical level and decision responsibility is shared by all the members, it is unstructured group.

According to Vroom and Yetton, (1973) organizational decision making units can be formed as five models. Those are Autocratic I, where an individual holds decision power and responsibility of outcome is only his. Autocratic II, Consultative I and Consultative II are group decision making with leader settings that only the amount of information or recommendation that the leader receives from subordinates varies but the leader is still the responsible party. With this perspective, those decision making groups are example to JAS. Group II is a pool of experts of related parties to the decisions and their responsibility thus power on decision assumed to be equally weighted, as in the unstructured decision making groups.

Many research show that unstructured groups and JAS have important procedural and outcome differences. If we start with procedural factors, within a JAS, judge have the authority to manage information flow. Whereas in the unstructured groups, information flow is unrestricted (Keyton, 1999). Also decision roles assigned to judge and advisor at JAS create different perceptions of task especially for advisor when compared to individual decision making (Harvey, Koehler, & Ayton, 1997; Koehler &

Harvey, 1997), whereas roles assigned to the members in the case of unstructured group is unique.

Other expected differences listed by Savadori and his colleagues are “equity of participation, responsibility for the decision, leadership, power, consensus seeking and perception of information” (2001, p.740). Van Swol (2009) made a review of those reasons listed in combination with other research findings (e.g., Van Swol & Ludutsky, 2007).

First, assigned roles determine responsibility for the decision and amount of the effort exerted for the task. Savadori and his colleagues (2001) found that judge feels more responsible and rates himself as the member which put most effort compared to advisors. On average judges found to feel more responsible than average unstructured group member.

Second, Van Swol and Ludutsky (2007) point out that “mutual enhancement” would be lower if a group is structured as JAS. Wittenbaum and his colleagues (1999) conceptualized “mutual enhancement” that group members have a perception that the participants who mention more common information has more task related knowledge since common information is verified by other members too. Since judge have decision power and information validation pressure to be lower within JAS, mutual enhancement and as a result repetition of common information would be lower (van Swol & Ludutsky, 2007).

Third, consensus seeking within JAS expected to be lower than groups due to role assignments compared to unstructured groups. Decision maker - the judge - subjected to no pressure such as agreeing any of the advisors. Consensus seeking found to be negatively correlated with unique information discussion within groups (Stasser & Stewart, 1992; Van Swol, 2007). For a group with high consensus seeking norm, common information is taken as an indicator of what the consensus decision should be (Henningsen & Henningsen, 2003). Whereas within JAS, judge mostly seek advice for gaining a new information or perspective (Schotter, 2003; Harvey & Fischer, 1997) they are more open to unique information and weight advisors which provide unique information heavier than the advisors which provide common information (van Swol & Ludutsky, 2007).

2.2.5. Common vs. unique information processing

When a problem to be solved is laid on the table, and a group of people are aimed at it, group members are generally assembled for their different perspectives or backgrounds (Hogarth, 1978). Since interaction with people holding different views than the individual improves that individual's decision making strategy (Schotter, 2003). Van Swol (2009) made a review of shared (common) vs. unshared (unique) information processing comparing JAS and unstructured group settings. A great number of research concluded that, unstructured groups discuss and review common information compared to unique information of group members and this behaviour is named as "collective information sampling bias (CIS)" by Wittenbaum and Stasser (1996; reviews of the research are, Stasser & Titus, 2003; Wittenbaum, Hollingshead, & Botero, 2004). Also literature points out that structuring groups as JAS decreases tendency of repeating common information and directs participants to take uniquely held information into consideration (Savadori et al., 2001; Van Swol & Ludutsky, 2007). Their work later revised by Van Swol (2009) and supported the evidence that groups structured as JAS skim through more unique information when compared to unstructured groups.

2.3. Advice and Advice taking

With a formal definition, what is advice? Advice is defined as "Guidance or recommendations offered with regard to prudent action" by Oxford Dictionaries Online. By this definition, expectation of an individual while asking for advice is a prudent, careful and thoughtful, course of action.

"Many (if not most) important decisions are not made by one person acting alone," is stated by Bonaccio and Dalal (2006, p.127) as opening remarks to emphasize importance of advice taking in our life. Indeed, every one of us can recall memories of seeking advice about buying a car or renting a home. As individuals, we are always subjected to advices from our environment. Family, friends, colleagues and even Google Ads give their suggestions supposedly to support us. According to many findings, those suggestions and opinions make important contribution to our accuracy (e.g. Gardner and Berry, 1995, Sniezek et al., 2004, Yaniv 2004a) whereas not as much as to our confidence (Sniezek and Buckley, 1995, Heath and Gonzalez 1995, Klayman et al., 1999, Soll & Klayman, 2004).

Bonaccio and Dalal (2006) made a comprehensive literature review of advice taking. As the backbone of literature review of advice giving/taking field, organization of their paper will be followed. According to the paper, an “input-process-output” model is suitable to analyze a JAS.

2.3.1. Advice Utilization

Within social context there is an extent to which we use recommendations or suggestions coming from our environment. Advice giving/taking literature use the term “advice utilization” as a measure of one's accepting advice. “Advice discounting” is the term used for rejecting advice.

Initially I want to focus on why people seek advice. Harvey and Fischer (1997) stated that there are three important reasons why people do not fully reject given advice. First, people are reluctant to reject advice even if expertise level of the advisor is not much higher than their own. Sniezek and Buckley (1995) also found the fact that if freely offered advice, such as from your mother, is rejected, there is a perceived probability which this advice will not be exist for future advice searches. Second, people use received advice to improve accuracy of their final decision for the cases that they believe expertise differences between them and advisor is visible (Sniezek, Schrah and Dalal, 2004; Dalal 2001). Lastly, when judges have sufficient expertise on the task and perceive that judgement have high risk, they tend to accept advice for sharing the responsibility (Schrah et al., 2006). Another reason for seeking advice is hoping to find new information or an alternative course of action (Heath & Gonzalez, 1995). Schotter (2003) also stated that advice that people receive makes them have a new point of view about the situation.

When JAS literature is investigated, it is found that judges mostly discount advice more than optimal (e.g., Gardner & Berry, 1995). Yaniv and Kleinberger (2000; Yaniv 2004b) named this behaviour as “egocentric advice discounting’’. For experiment designs with pre-advice judgement is taken from the judge, it is evitable that judge weight his/her own judgement more than the advice since judge have the mental model to reach that judgement whereas he/she have minimal or no cue about advisor's mental model.

Krueger (2003) concludes the reason of discounting is “egocentric bias” with a main pillar of perception of judges being better than everyone. Even when there is no pre-advice judgement or no relevant cues are available, people tend to refer their reasoning (Clement & Krueger, 2000) or irrelevant supporting evidence (Cadinu & Rothbart, 1996). With this respect, “egocentric bias” differentiates from “egocentric advice discounting’’. One is based on anchoring and adjustment strategy (Tversky & Kahneman, 1974; Harvey & Fischer, 1997; Lim & O’Connor, 1995) whereas the other is not. Harvey and Harries (2004) also supports that egocentric bias (conservatism is the term used) is a long term, applicable to whole of daily life whereas anchoring and adjustment is a case-dependent strategy. According to their findings, egocentric behaviour is so robust that participants believe that they are evaluating their past forecasts gave more weight those forecasts, even if the forecasts were not theirs.

However, rejecting or accepting an advice depends on many other factors (Sniezek and Buckley, 1995, Yaniv 2004a, 2004b). From an organizational point of view, a project manager receiving progress reports from a number of field manager and deciding on next quarter's course of action can be considered as an example of JAS. When this scenario is considered, weight to be assigned to each field managers' suggestion by the project manager depends on many aspects. Perceived experiences of field managers, confidence they express and past wisdom they added to the information pool (Yaniv, 2004a) are important cues for their weight for the decision process on the table.

Expertise level of advisor that judge perceived is formed also by cues, such as working period, graduated school, age etc. (Feng & CacGeorge, 2006) or a reference of previous useful advice (Yaniv and Kleinberger, 2000). Expert advice is found to be more helpful and influential than novice advice (Goldsmith & Fitch, 1997; Jungermann & Fischer, 2005). Also if judge perceives him/her less experienced than the advisor or other judges than the judge assign more weight to the advice (Sniezek, Schrah, & Dalal, 2004; Yaniv, 2004b; Yaniv & Kleinberger, 2000; Yaniv & Milyavsky, 2006).

Confidence that advisor states is another important cue to evaluate if proposed solution or choice will serve to obtain desired outcome for that specific situation. If

stated confidence is high, judges assign more weight (Sniezek and Buckley, 1995, Sniezek and Van Swol 2001). Finally, for repetitive tasks, or in studies that judge receives more than one advice from same advisor, accuracy and confidence that advisor states is learnt by the judge and used as a cue for question in hand (Yaniv and Kleinberger, 2000). Perceptionally good advice is utilized more whereas poor advice is less utilized. Judges are also sensitive to changes of the quality of the advice. As in the social context, gaining one's trust is harder to lose that trust.

Another important factor in taking or rejecting one's advice is having or not having history with that person. Sniezek and Van Swol (2001) tested strangers to people in ongoing relationships within JAS context. They concluded both judge and advisor in ongoing relationship setting stated higher trust. While this high trust is correlated with acceptance of advice and judge confidence, it cannot contribute to judge accuracy.

Reward system based on the performance is also one of the manipulated variables within the literature (Sniezek & Van Swol, 2001; Sniezek et al., 2004; Dalal, 2001; Camerer and Hogarth, 1999). Gino (2008) found that free advice is discounted more than paid advice. In the experimental setting one of the parties may be determining if other will receive incentive and to which fraction. Within those settings, if judge pays before receiving advice (Sniezek et al., 2004) or have the reward power (Sniezek & Van Swol, 2001), advice is discounted less on average (but see Van Swol & Sniezek, 2005).

2.3.2. Measurement of advice utilization

For evaluating the extent to which a given advice is utilized or discounted, JAS and advice taking researchers generated some measurement tools. Two measures used within the literature were "weight of advice" (Yaniv, 2004b) and "weight of own estimate" (Yaniv and Kleinberger, 2000).

$$\text{WOA (weight of advice)} = |\text{Final J} - \text{Initial J}|/|\text{Advice-Initial J}|$$

$$\text{WOE (weight of own estimate)} = |\text{Advice} - \text{Final J}|/|\text{Advice-Initial J}|$$

WOA and WOE calculations for advice utilization are sufficient for a system with one judge and one advisor. Thus their adapted to group decision making and advice receiving versions will be used for the analysis.

2.3.3. Confidence

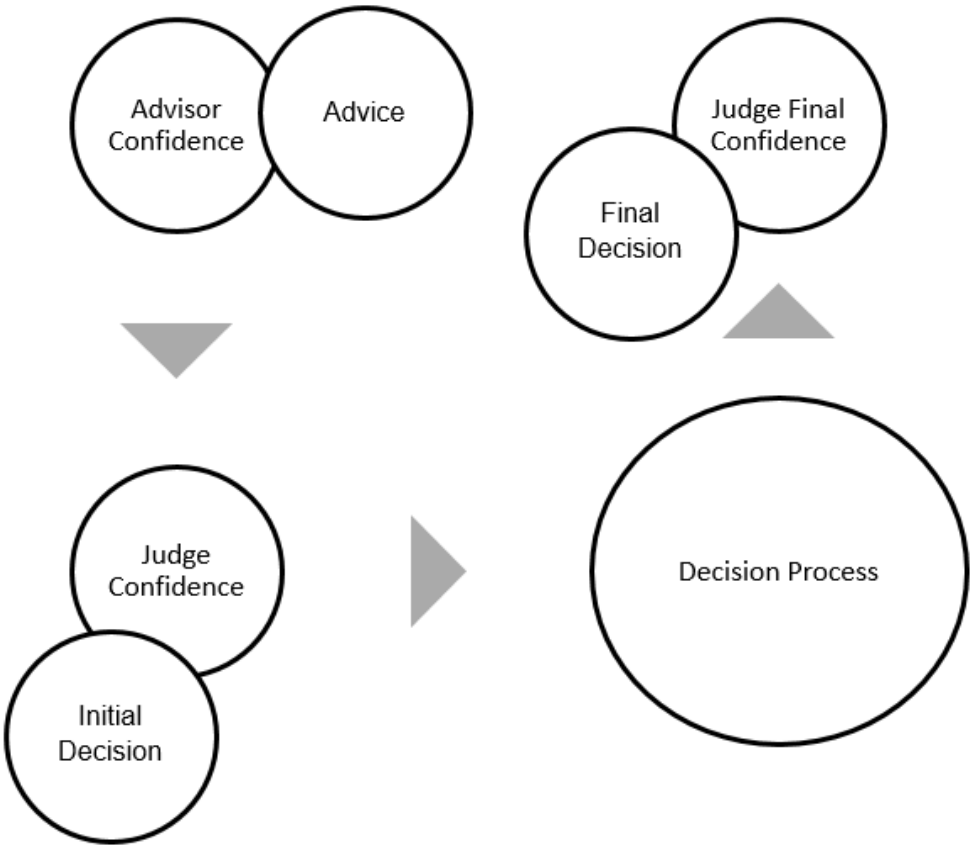

Figure 2 Description of Decision Process

Confidence for a JAS setting is defined as a statement of evaluation of correctness of one's judgement or recommendation. It is also used as an interval stated that the answer is believed to fall within (Klayman et al., 1999). Using the classification of Bonaccio and Dalal (2006), confidence(s) expressed by advisor(s) and pre-advice confidence formed by the judge are used as cues for weighting the answers generated. Thus those serve as an input for final judgement (answer) and at the same time final confidence rating expressed by the judge, as in the illustration in Figure 2.

As mentioned in "Advice Utilization" part, confidence expressed by the advisor(s) is the main cue for judge during aggregation of advices from multiple advisors or weighting own pre-advice judgement to advice received. Price and Stone (2004) explain this by "confidence heuristic" that confidence rating is the basis for the judge

to evaluate and decide about other properties of the advisor such as knowledge, ability or accuracy. Use of confidence heuristic derives judges to utilize even overconfident advice more than well-balanced confidence stated advices. Overall the literature there is a trade among judges that utilization of higher-confidence advice is higher than lower-confidence advice (Sniezek & Buckley, 1995; Phillips, 1999; Lawrence & Warren, 2003; Van Swol & Sniezek, 2005). But also judges discount advice when confidence associates it is extremely high (Yates et al., 1996) especially if judge is suspicious that the advisor express the high-confidence to deceive them (Van Swol, 2009). Aggregating a number of advisors also suppress the effect of advisor confidence and agreement between advisors become the dominant cue for utilization (Sniezek & Buckley, 1995).

Relation between confidence and accuracy of the advice is at a debatable point. Whereas some researchers concluded that confidence and accuracy have important positive correlation (Sniezek and Van Swol 2001; Van Swol and Sniezek, 2005), some other works exists that do not support this position (Phillips, 1999; Gibbons et al., 2003). Assigning individuals more knowledgeable (score higher than 7) as advisors and less knowledgeable (score lower than 7) as judges within the experiment made by Sniezek and Van Swol (2001) can be the reason of confidence-accuracy relationship. Another cue for accuracy for interval advices is width of the interval (Yaniv, 1997; Yaniv & Foster, 1997).

Other two data collected in terms of confidence are judge pre-advice and post-advice confidences. If the judge perceives himself/herself as less knowledgeable and express a low pre-advice confidence, advice seeking behavior intensifies and number of advisors that judge consults increases (Harvey & Fischer, 1997; Cooper, 1991). Post-advice confidences are higher in overall than pre-advice confidences expressed by judges (Heath & Gonzalez, 1995; Savadori et al., 2001). This inflation of confidence can be a result of finding supporting evidence for their decisions (Harvey & Fischer, 1997) or thinking the judgement problem using a new point of view (Schotter, 2003) or increase of exerted time and effort to the task (Kuhn, Spurlock, & Sniezek, 1998; Paese & Sniezek, 1991).

Since final judgement and confidence are a result of decision process with many inputs and environmental variables, post-advice confidence should be examined

under those variables. Final (post-advice) confidence positively correlated with advice accuracy (Budescu et al., 2003) and number of advisors (Budescu & Rantilla, 2000). But also agreement between advisors play an important role such that if the judge perceive disagreement between advisors, confidence is low (Budescu et al., 2003; Savadori, Van Swol, & Sniezek, 2001; Sniezek & Buckley, 1995). Another variable is the amount of effort that the judge have to exert for conclusion. If the judge is to exert more effort, expressed confidence is higher (Kuhn, Spurlock, & Sniezek, 1998; Paese & Sniezek, 1991).

When accuracy and confidence expressed by the judges examined, it is robust that judges are overconfident with their judgements (Klayman et al., 1999; Sniezek & Buckley, 1995; Soll & Klayman, 2004). Koriat (1980) also examined overconfidence using general knowledge questions used in Experiment 3 by Lichtenstein and Fischhoff (1977). Experiment was formulated as a multiple-choice task with two options thus participants would choose between “1” and “2”. Participants who are asked to provide both supporting and contradicting reasons for their chosen option were better calibrated at their confidence ratings compared to ones who expressed only supporting reason for chosen option or only contradicting reason for rejected option. Thus Koriat (1980) concludes one important reason for overconfidence is a result of limited evaluation of cues or knowledge and bias of disregarding the evidence which is contradicting with chosen option.

2.4. Judge-Advisor Systems

Role of advice taking during decision making is being studied by thirty years now. Bonaccio and Dalal (2006) addresses Brehmer & Hagafors (1986) as the first paper in the area. Formal description and framing is brought to the area by Sniezek & Buckley (1995), namely Judge – Advisor System (JAS). The term “judge” stands for the participant who is held responsible for the outcome of the decision. Judge also receives information from advisor(s) and holds the power to evaluate that information. Here “advisor” is the participant who is responsible of giving advice, suggestions or recommendations to the judge. Illustration of Bonaccio and Dalal’s (2006) input-process-output model of JAS can be seen on Figure 3.

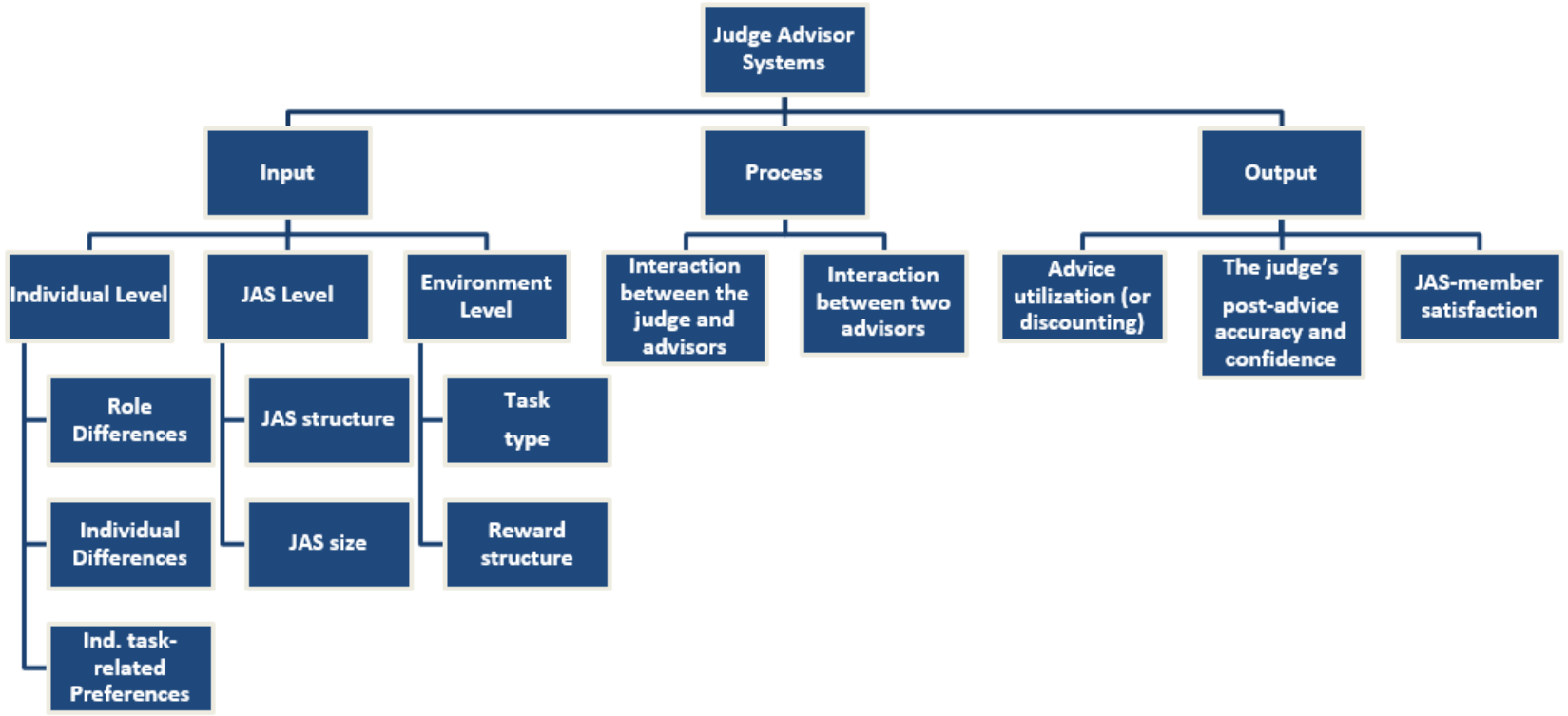

Figure 3 Tree Diagram of Bonaccio & Dalal's input-process-output description of a judge-advisor system (Adapted from "Advice taking and decision-making: An integrative literature review, and implications for the organizational sciences" by Bonaccio, S., and Dalal, R. S. 2006.. Organizational Behavior and Human Decision Processes, Vol. 101, pp. 127-151.)

2.4.1. Number of participants

A typical JAS have one judge and at least one advisor (Harvey & Fischer, 1997; Yaniv, 2004b). Throughout past research, two (e.g. Yaniv, 1997), three (e.g. Budescu et al., 2003), four (e.g. Harvey et al., 2000) and six advisors (e.g. Budescu & Rantilla, 2000) were used. Number of advisors increased up to ten (e.g. Rantilla, 2000). As a conclusion from Yaniv and Milyavsky (2006), varying number of advisors is not an important variable for judges. Discounting advice and promoting their own initial judgement is a widespread strategy. Judges can also discount advices far from their initial judgements. Budescu & Rantilla (2000) also stated that number of advisors positively correlated with confidence expressed by judges while increasing number of advisors do not improve accuracy.

2.4.2. Interaction Ground

Advice formed by advisor is conveyed to the judge by face-to-face interview (Savadori et al., 2001, Van Swol and Ludutsky, 2003, Van Swol and Sniezek, 2005), using a videoconferencing system (Gibbons et al., 2003), writing notes within same room (Dalal, 2001, Sniezek and Van Swol, 2001 Experiment 2). Another type of application is real people interact but not seeing each other (Sniezek and Buckley, 1995, Sniezek et al., 2004, Sniezek and Van Swol, 2001 Experiment 1). Some JAS studies collected a pool of advices beforehand and judges received random advice from that pool (e.g. Schrah et al., 2006; Yaniv, 2004b; Yaniv & Kleinberger, 2000). Last strategy is held when experimenter generates the advice to be given to judge during experiment (Brehmer & Hagafors, 1986; Budescu et al., 2003; Harvey and Fischer, 1997), but judge is told that advice came from a real person (i.e. expert).

2.4.3. Pre-advice Judgement

Some experimental design encouraged or forced judges to make a decision prior to their access to advice (e.g. Harvey & Fischer, 1997; Sniezek et al., 2004; Gino, 2008). Main output expected from the pre advice judgement is the ground for calculating advice utilization using for example weight of advice (WOA) (Yaniv, 2004b) or weight of estimate (WOE) (Yaniv and Kleinberger, 2000) formulas. The other design gives question and advice to the judge at the same time (e.g. Harvey et al., 2000; Van Swol & Sniezek, 2005). This kind of a procedure can be more

beneficial for the research examining how a judge aggregate advice from multiple advisors (e.g. Budescu et al., 2003).

2.4.4. Type of task

Different types of tasks being used for JAS so far. Some of those are, guessing probabilities of events (e.g. Budescu & Rantilla, 2000), dates of historic events (e.g. Gino, 2008), multiple-choice questions (e.g. Sniezek & Buckley, 1995) or story based decision making (e.g. Karau, 1996; Savadori et al., 2001). Type of the task determines the extent of the advice that the advisor provides (e.g. “Choose B, I’m 85% sure” or “That happened in 1990’s”). Due to task type, outcome of the experiment and measures to be used for them also differs.

Task types can be generalized mainly under two branches as “choice” tasks and “judgement” tasks (e.g., Billings & Scherer, 1988; Gigone & Hastie, 1997). From this perspective choice tasks have a number of distinct answers for judges to choose in between them (e.g. Sniezek & Van Swol, 2001; Gibbons et al., 2003). Judgement tasks do not have such a limitation, but judges have to provide a quantitative (e.g., Fischer & Harvey, 1999; Budescu et al., 2003; Yaniv, 2004b; Schrah et al., 2006) or qualitative (Savadori et al., 2001) projection.

2.4.5. Accuracy of final Judgement

An important reason for seeking advice and using it as a part of decision process is increasing accuracy of one’s final judgement (Harvey & Fischer, 1997). Within literature receiving and aggregating the advice is found to really increase accuracy of the judge’s final decision (e.g., Gardner & Berry, 1995; Sniezek et al., 2004; Yaniv, 2004a). But there are exceptions also exist at past research (Heath & Gonzalez, 1995 and Van Swol & Ludutsky, 2003).

Accuracy of final judgement depends on a number of variables. Bonaccio and Dalal (2006) categorized these variables as JAS-level variables and classified as; task-related information that advisor holds, accuracy of advice produced, and weight assigned to each advisor by the judge. If we use terms used by Harvey & Fischer (1997), increase of the accuracy is expected when judge is knowledgeable enough to differentiate good advice from bad advice and advisor is more knowledgeable

enough to evaluate his/her advice quality (Hedlund, Ilgen, & Hollenbeck, 1998; Hollenbeck, et al., 1995; Humphrey et al., 2002).

For the repetitive tasks a number of factors play an important role for learning dependent variables and enhancing decision quality. Feedback that judge receives about his/her accuracy is found that improving accuracy (Hollenbeck et al., 1998; Fischer & Harvey, 1999). Within the designs employing many advisors and some of which are outliers, judges learn to distinguish good vs. bad advice in the outlier group and benefit from them (Harries et al., 2004).

CHAPTER III

METHOD

Information perception differences between groups and judge-advisor systems investigated before (Savadori et al., 2001; Van Swol, 2009). Those researches concluded if a group is structured as a JAS, due to some variables, perception of common and unique information changes. Main aim of this work is to determine if there exists any accuracy and confidence rating differences occur if an unstructured group receive advice. Within this work, the groups are split into three in terms of advice receiving. Setting 1, control group, received no advice on any step and they completed only two step decision making process. Existence of Setting 1 provides a basis for comparison as an unstructured group. Setting 2, initial opinion, receive advice after they form group and three members see the same advice for group task. Setting 3, advice first, all three participants received different advices during individual decision making steps and they form no initial judgement. After the groups are formed in Setting 3, no further advice is given. A general procedural flow of all three settings can be examined at Table 1.

Table 1 Procedural Flow of Experiment

	Setting 1	**Setting 2**	**Setting 3**
Steps	Individual Decision	Individual Decision	Take Advice
	Form Group	Form Group	Individual Decision
	Group Decision	Take Advice	Form Group
		Group Decision	Group Decision

3.1. Advice Generation

Advice given to participants assigned to Setting 2 and 3 are generated randomly and aimed to have close variation. For this aim, the first advice given to individuals which participates Setting 3 designed using the rule of three different advices generated as follows;

Minimum = Date - (5+RANDBETWEEN(1;5));

Medium = Date + RANDBETWEEN(-5;5);

Maximum = Date + (5+RANDBETWEEN(1;5)).

This randomization bracketed advice given within ± 10 years from real occurrence date. Minimum, medium and maximum advices generated assigned individuals randomly for each question. This way, bias that can be generated due to repetitive status of the advice aimed to be eliminated.

Then advice to be given to the groups participating Setting 2 designed such that mean absolute error of minimum, medium and maximum advices' used within Setting 3 taken and added to or subtracted from occurrence date of the event for each question. This ensured, Setting 2 and Setting 3 advices have the same mean absolute error. Details of the generated and used advice can be seen on Appendix.

3.2. Experiment

For the experimental setting, 20 general knowledge questions of various topics are selected. Participants were expected to give occurrence years of those events. Dates of the events were between 1912 and 2001. Participants answered those questions twice, one on individual decision making session, and one in group decision making session. On both sessions, guessing date and giving confidence ratings from 0 % to 100 % are asked. Experiment booklets can be seen on Appendix.

Experiment is held within three different settings and each participant took place only once. Information and cover page have the following explanation:

> *"This study that you will participate aims to search for individual and group decisions, debates and communication tendencies. This study consists of two parts; the first part contains 20 questions which will be answered individually and the second contains 20 questions which will be answered by the groups of 3. Please follow the instructions of the study moderator."*

Setting 1: Control group

In this setting individual decision making session starts with the following explanation:

"You will find 20 general culture questions on important events after the beginning of the 20th century. Please answer them individually and place your answers of years to the box next to "Answer". Please fill the box next to the "Evaluation" with the percentage of your confidence, 0% for totally unsure answers and 100 % for totally sure answers."

Group decision making session starts with the following explanation:

"You will find 20 general culture questions on important events after the beginning of the 20th century. Please answer them after discussing them with your group and place your answers of years to the box next to "Answer". Please fill the box next to the "Evaluation" with the percentage of your confidence, 0% for totally unsure answers and 100 % for totally sure answers."

Setting 2: Initial opinion

As in the Setting 1 individual decision making session is the no-advice decision making task. Group decision making session is the step that participants receive the advice and it starts with the following explanation:

"You will find 20 general culture questions on important events after the beginning of the 20th century, and an answer of a field expert in parentheses who answered these questions before. Please answer them after discussing them with your group and place your answers of years to the box next to "Answer". Please fill the box next to the "Evaluation" with the percentage of your confidence, 0% for totally unsure answers and 100 % for totally sure answers."

Setting 3: Advice first

Main difference in this setting is, the participants will receive a question booklet with advices for each question on the individual decision making session which starts with the following explanation:

"You will find 20 general culture questions on important events after the beginning of the 20th century, and an answer of a field expert in parentheses who answered these questions before. Please answer them individually and place your answers of years to the box next to

“Answer”. Please fill the box next to the “Evaluation” with the percentage of your confidence, 0% for totally unsure answers and 100 % for totally sure answers.”

Group decision making session of this setting is same with setting 1.

3.3. Procedure

Paper-based experimentation is preferred because of technical infrastructure of the research environment would not be able to support group work on computers. Experiment is held in two steps as planned. Participants first received a sheet for individual work attached to the information sheet. Participants filled only age, gender and year enrolled to information sheet. After completion of individual decision making session, they formed the groups according with the codes on the individual work sheets (i.e. participants coded Hy 01, Hy 02 and Hy 03 then received group work sheet Hy010203).

All three settings are applied to students after a typical lecture meeting. Students have participated in the experiment voluntarily for extra course credit. A total of 183 students who enrolled in a second year course at Gazi University Engineering Faculty Industrial Engineering Department took the experiment. They are asked to form groups of three and individual decision making sheets are distributed. After explaining the procedure that they will answer an individual and a group step, they started. When all three participants of the group is done with the individual step, group decision making sheets are distributed and discussion and consensus is encouraged.

Because of losing attention some groups did not fill in group answers or confidence ratings and also some individuals did not answer a number of questions or confidence ratings. Due to this sort of missing data, 15 groups are not taken into analysis.

After eliminating corrupt data sets, 16 groups for Setting 1 application, 17 groups for Setting 2 application and 13 groups for Setting 3 application left. Answers of 138 participants are analysed.

3.4. Participants

Total of 138 participants attended to the experiment taken to the analysis. Ages of the participants change between 18 and 32 with an average of 20.73, as can be seen in Figure 4.

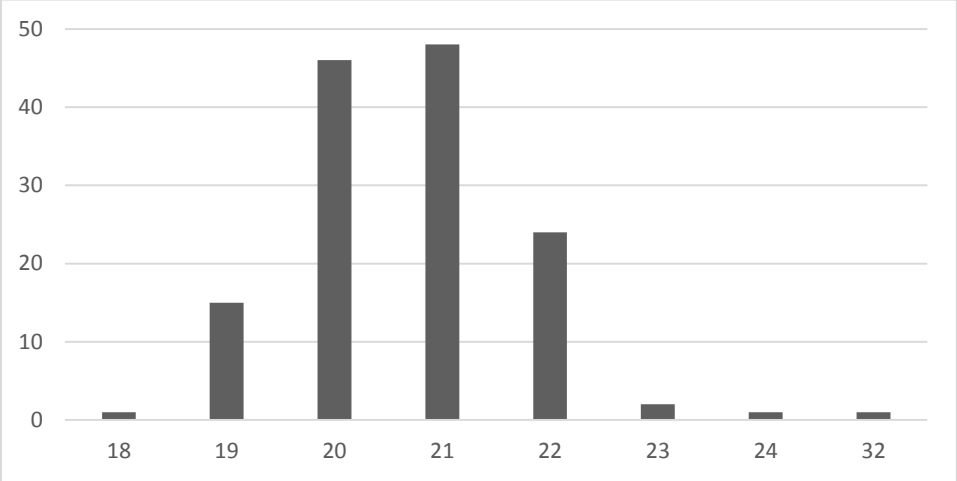

Figure 4 Age distribution of Participants (n=138 Ave=20,73)

Since there is no limitation for junior and senior students to attend the sophomore year class, experiment applied to a wide range of ages and enrolled years. Due to general characteristic of Industrial Engineering, female participants are dominant.

Table 2 Demographic Distribution of Participants

Grade	**2**	**3**	**4**
Frequency	116	15	7

Gender	**Female**	**Male**
Frequency	110	28

CHAPTER IV

RESULTS

Data gathered from 138 participants analysed in terms of accuracy and confidence within and between settings. 48 participants for Setting 1, 51 participants for Setting 2 and 39 participants for Setting 3 analysed using statistical methods. Mostly used advice utilization measures, weight of advice (Yaniv, 2004b) and weight of own estimate (Yaniv and Kleinberger, 2000) are also calculated but since data on hand was not bracketed, those measures found to be non-applicable to the data set. Bracketed data should be Initial answer (I) < Final answer (F) < Advice (A) or A < F < I when the numerical answers are studied. In the case of F < A < I and I < A < F, overshooting occurs and WoA and WoE fails to produce comparable measures.

4.1. WoA and WoE analysis

First, WoA and WoE calculations held on the Setting 2 which is the only setting that giving initial answer, receiving advice, giving final answer procedure is followed. As initial answer, average of all three individual answers and as final answer, group answers are taken for each question.

$$Error_I = Occurrence\ Date - Average\ (DM1Answer, DM2Answer, DM3Answer)$$

$$Error_F = Occurrence\ Date - GroupAnswer$$

$$Error_A = Occurrence\ Date - Advice$$

As the basis of the comparison, errors of the answers are taken. For simplicity and applicability to WoA and WoE measures, averages of individual decisions taken to be used as a single factor of pre-discussion decision (Onkal, Sayım & Gönül, 2013).

As a result, WoA came out to be 2,1499 (SD = 3,0453) and WoE is 1,867 (SD = 3,193) as average of Setting 2. Since within the data overshooting answers exists, WoA and WoE were not applicable to the analysis of the data.

Table 3 An Example Set of Answers, Advice and Date of Event

DM1 Answer	DM2 Answer	DM3 Answer	Individuals' Average	Advice Given	Group Answer	Occurrence Date
1998	1960	2003	1987	1992	2003	1986
1998	2000	1990	1996	1992	1998	1986

Two groups' answers for the same question can be seen Table 3. Groups adjusted their final answer sometimes towards the advice and sometimes away from the advice. As the answers of the groups were examined generally, both of these situations were seen on equal frequencies.

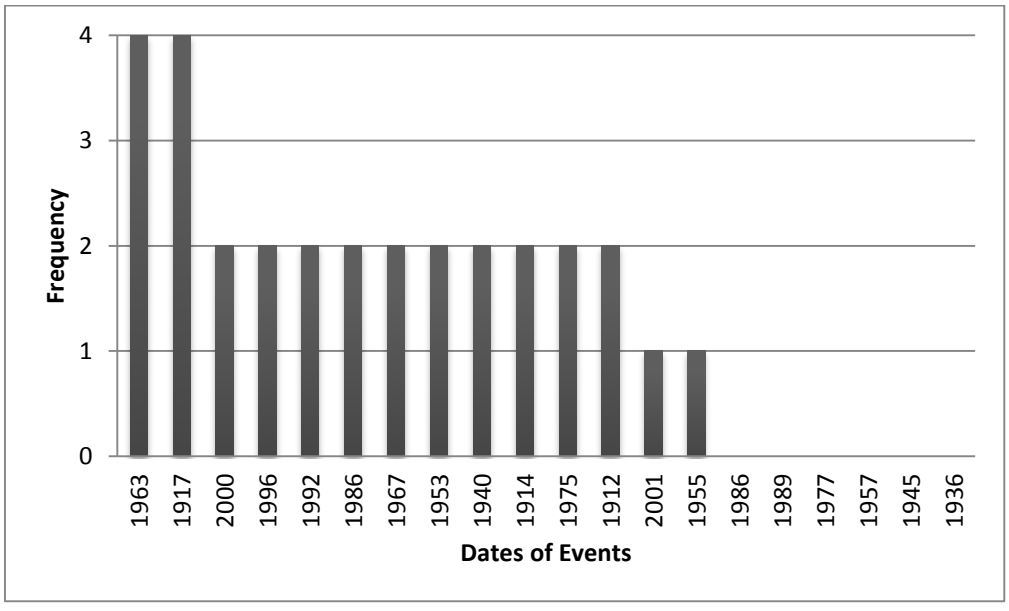

Figure 5 Dates of Events vs. Frequency of Giving High WoA measures within Setting 2

For this reason, two highest WoA scores of each team in Setting 2 analysed question based. No dominantly deceived question perceived. Also in terms of occurrence dates of the events, no link can be found to the highest WoA recorded questions. Recentness of the events did not create any difference for WoA found. This points the conclusion that, acceptance of advice shows no dependency to recentness of historical events in this work. Frequency of high WoA vs. occurrence dates of event can be seen on Figure 5.

Later, if any domination of individuals exists within groups investigated in terms of demographic structures. For this analysis number of group answers equals to individual's answers counted. Within groups, if the highest acceptance number is higher than the sum of acceptance number of other two members, domination of that individual accepted. Within eight groups of seventeen groups, domination is encountered.

Five female and three male dominated their group. Average of dominant's age is 22,4; which seems higher than the average participant age but dominant members are the oldest of their group within only two of the groups. Gender, enrolled class and age of the groups that domination effect encountered do not differ from the groups without any domination effect.

4.2. Statistical Analysis

The analysis of all settings was done by using statistical methods after WoA and WoE analyses were finished. Mainly calculated outputs are;

1. Comparison of accuracies of the individual and group answers within the setting groups.
2. Comparison of the setting groups by the means of individual accuracies.
3. Comparison of the setting group by the means of group accuracies.
4. Comparison of confidences of the individual and group answers within the setting groups.
5. Comparison of the setting groups by the means of individual confidence.
6. Comparison of the setting group by the means of group confidence.

For these analyses, first “comparison within setting” and then “comparison between settings” data will be presented and discussed. Again for the comparisons of accuracies, errors of the answers were used, as previously mentioned.

4.2.1. Within-Setting Analysis

4.2.1.1. Setting 1

Within Setting 1; distribution of all sixteen groups’ mean individual and group errors can be seen in Figure 6. If average of all the groups taken; individual answers’ average error is 29,78 (SD = 32,76) whereas group answers’ average error is 33,36 (SD = 43,56). Comparing distribution of the data using t-test, all p > 0,05.

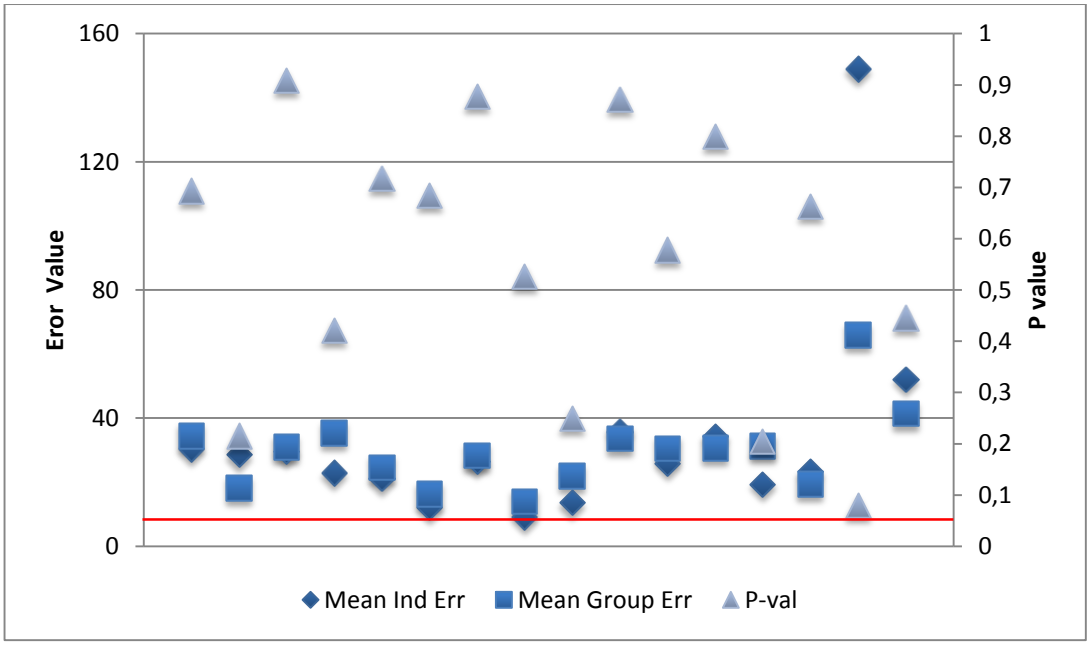

Figure 6 Individual vs. Group Error of Setting 1 and respective p values

Confidence distribution of the groups in Setting 1 can be seen in Figure 7. Individual confidence rating average is 30,22 (SD = 17,44) whereas group confidence rating average is 47,98 (SD = 23,47). Comparing distribution of the data using t-test, five groups’ p > 0,05 whereas eleven groups’ p < 0,05. Those five groups compose of women average age of 19,8.

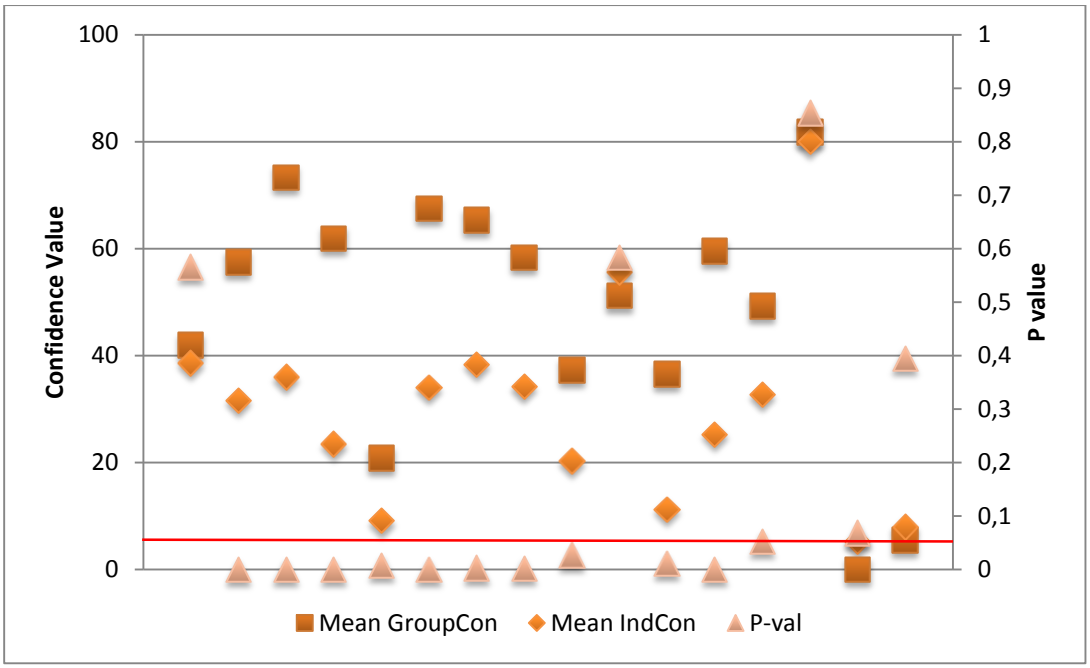

Figure 7 Individual vs. Group Confidence of Setting 1 and respective p values

4.2.1.2. Setting 2

Within Setting 2; as an addition to accuracy and confidence comparisons between individual and group steps, accuracy of group decision compared against given advice. Distribution of all the seventeen groups' mean individual and group errors can be seen in Figure 8. If average of all the groups taken; individual answers' average error is 43,61 (SD = 42,17) whereas the group answers' average error is 27,33 (SD = 31,43). Comparing distribution of the data using t-test, four groups' $p < 0,05$ whereas thirteen groups' $p > 0,05$. Those four groups compose of 75% women average age of 20,5.

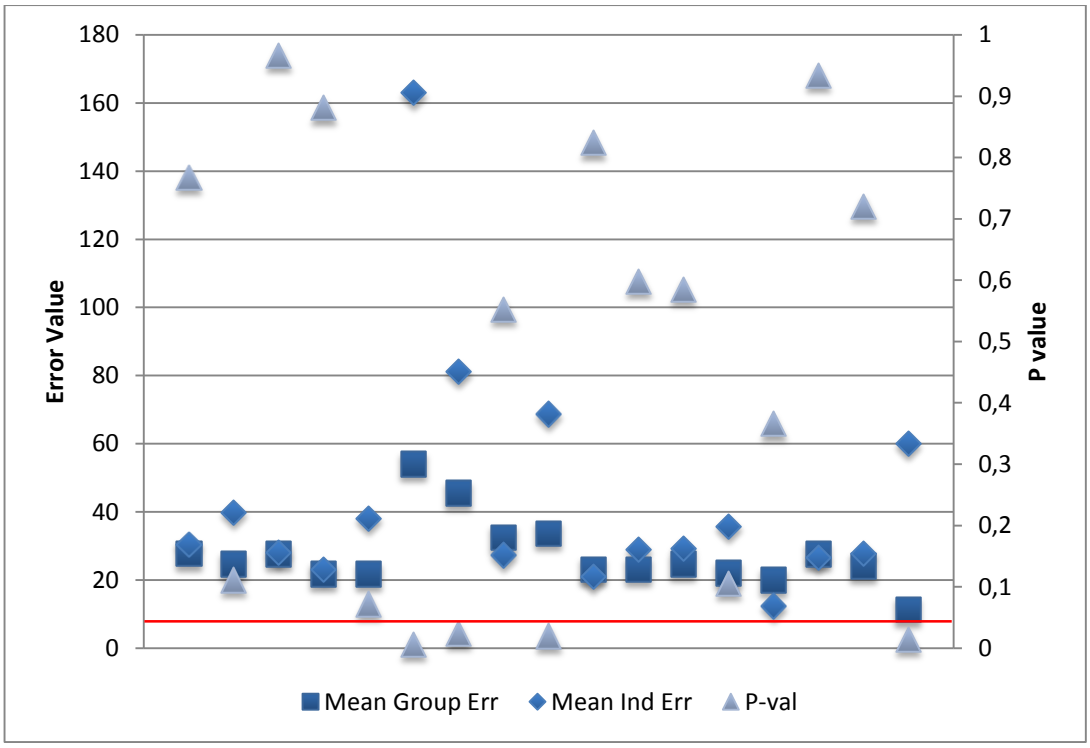

Figure 8 Individual vs. Group Error of Setting 2 and respective p values

Confidence distribution of the groups in Setting 2 can be seen in Figure 9. Individual confidence rating average is 22,97 (SD = 15,43) whereas group confidence rating average is 51,17 (SD = 21,69). Comparing distribution of the data using t-test, three groups' $p > 0,05$ whereas fourteen groups' $p < 0,05$. Those three groups compose of 66% women average age of 20,4. Only one group, #17 is common both on accuracy and confidence analysis but the group shows no distinct demographic characteristic.

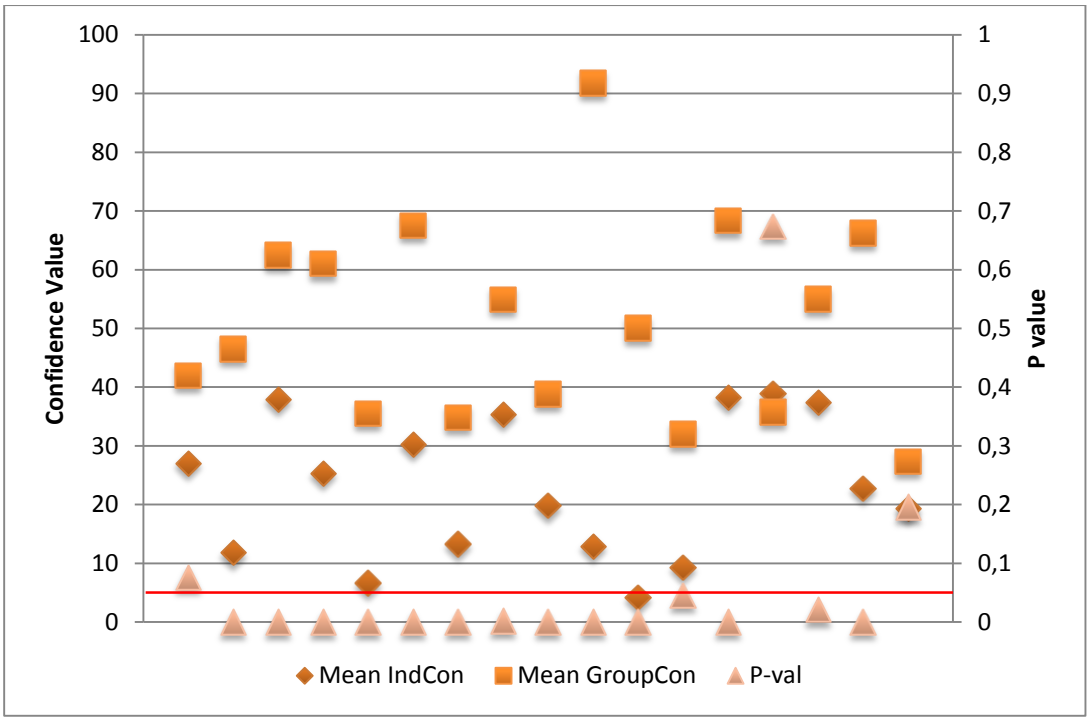

Figure 9 Individual vs. Group Confidence of Setting 2 and respective p values

The advice given to the participants arranged such that it will produce as close to zero when averaged between twenty questions of the experiment. For this reason, average advice error is 0,25 (SD = 6,37). Only one group, #17, has $p > 0,05$ all others have $p < 0,05$; as can be seen on Figure 10.

The advice to group decision comparisons held within Setting 2 shows that nearly all the groups significantly differ from the advice given. Thus we can conclude that advice utilization is low within Setting 2.

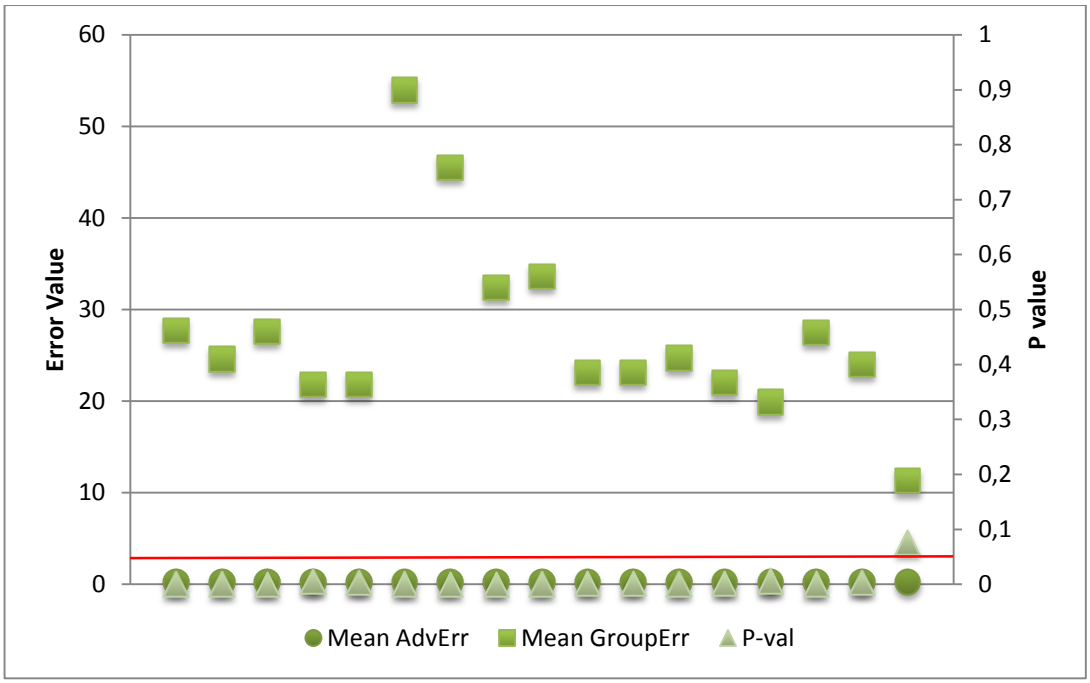

Figure 10 Advice vs. Group Error of Setting 2 and respective p values

4.2.1.3. Setting 3

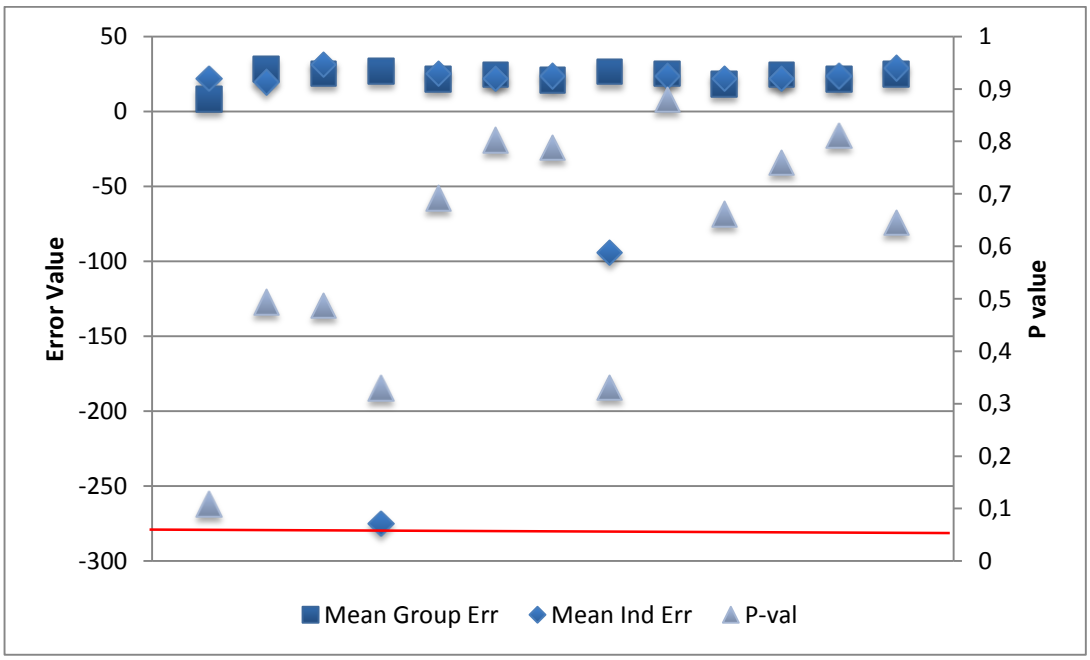

Figure 11 Individual vs. Group Error of Setting 3 and respective p values

Within Setting 3; since the advice is supplied to the participants in individual step, advice error used to determine in both situations if it is best utilized in individual step or group step.

Distribution of all thirteen groups' mean individual and group errors can be seen in Figure 11. If average of all the groups taken; individual answers' average error is -8,05 (SD = 169,64) whereas group answers' average error is 22,79 (SD = 29,69). Comparing distribution of the data using t-test, all $p > 0,05$.

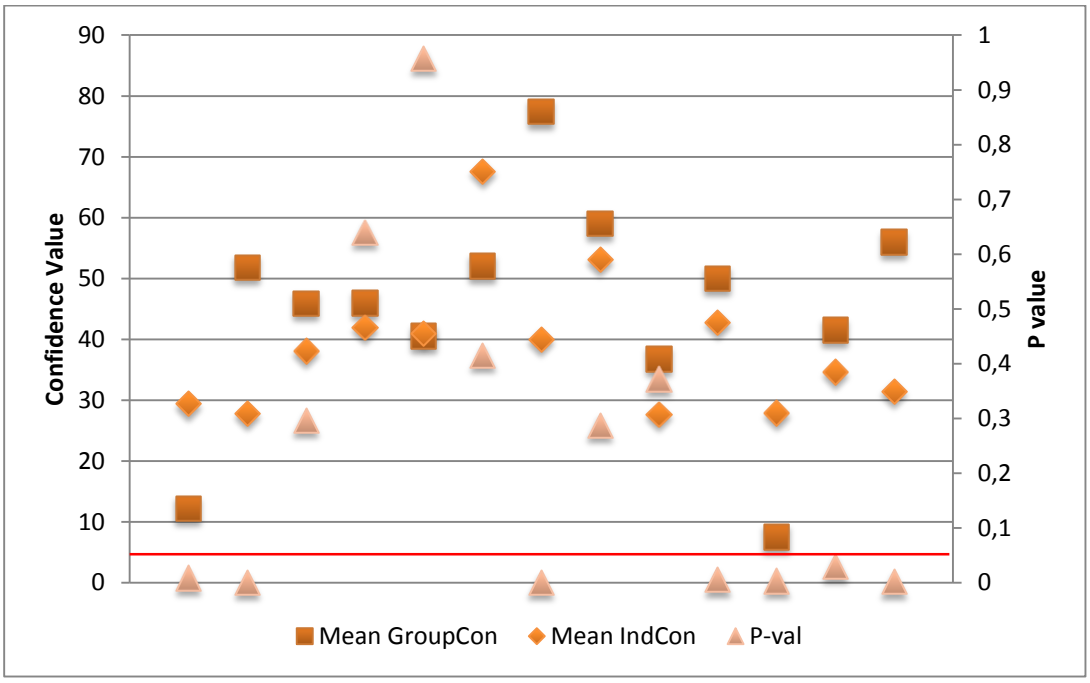

Figure 12 Individual vs. Group Confidence of Setting 3 and respective p values

Confidence distribution of the groups in Setting 2 can be seen in Figure 12. Individual confidence rating average is 38,73 (SD = 19,27) whereas group confidence rating average is 44,35 (SD = 24,66). Comparing distribution of the data using t-test, seven groups' $p > 0,05$ and six groups' $p < 0,05$ thus confidence within the setting is randomly changing.

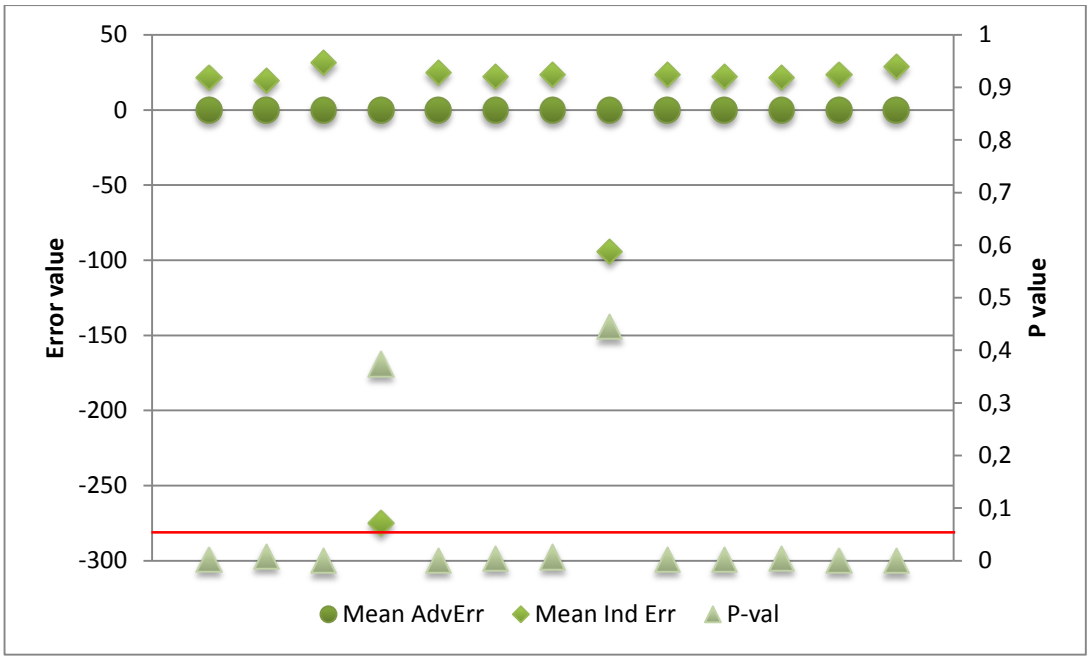

Figure 13 Advice vs. Individual Error of Setting 3 and respective p values

Comparison of advice error and individual error resulted that all $p < 0,05$ but two groups, as can be seen in Figure 13.

Comparison of advice error and group error resulted all $p < 0,05$ but one group, as can be seen in Figure 14.

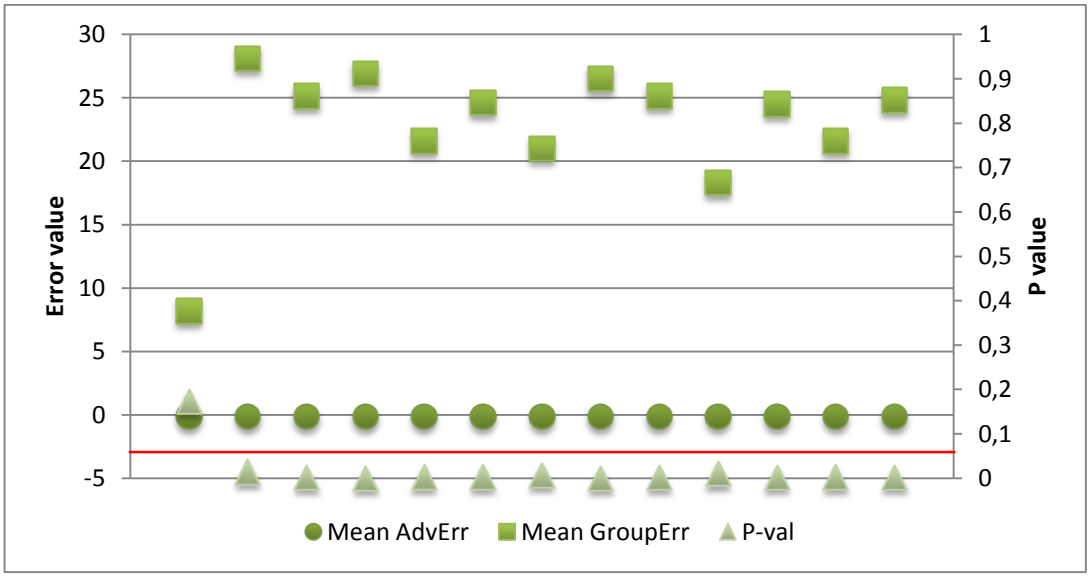

Figure 14 Advice vs. Group Error of Setting 3 and respective p values

Advice to group decision and advice to individual decision comparisons held within Setting 3 shows that nearly all groups significantly differ from the advice given on both individual and group decision making steps. This position points to conclude that advice utilization is low within Setting 3.

4.2.2. Between-Settings Analysis

After analysis of each group and comparing them to the same-setting groups; pooled setting errors and confidences are compared. First error analysis takes place.

One-way anova analysis of individual errors of the settings resulted to be statistically different (F_{45} = 3,9; p < 0,05); Figure 15. One-way anova analysis of group errors of the settings resulted to be statistically not different (F_{45} = 0,99; p > 0,05); Figure 16.

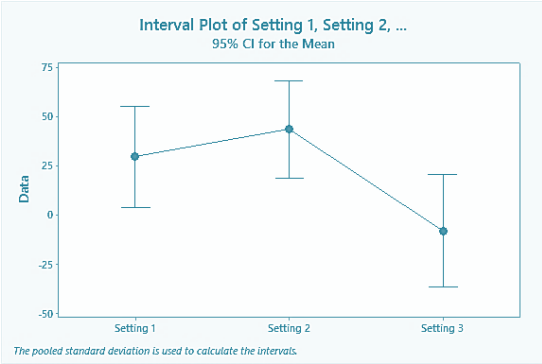

Figure 15 Individual Error Analysis of three Settings

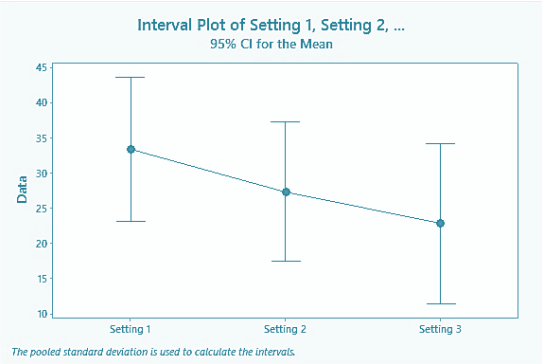

Figure 16 Group Error Analysis of three Settings

Pooled individual errors point to a statistically significant difference whereas pooled group errors are not significantly different when three settings analysed. But comparing pooled data using t-test, differences of any pairs of three groups are not statistically significant in individual error.

One-way anova analysis of individual confidences of settings resulted to be statistically different (F_{45} = 4,23; p < 0,05); Figure 17. One-way anova analysis of the group confidences of settings resulted to be statistically not different (F_{45} = 0,44; p > 0,05); Figure 18.

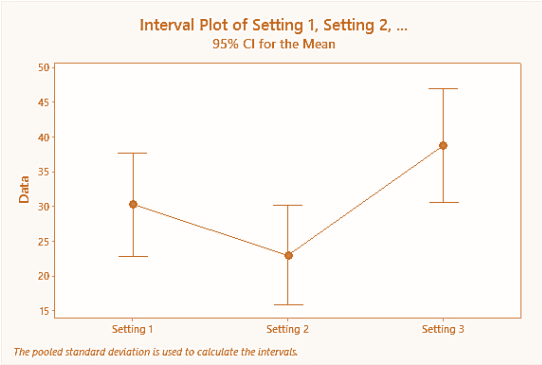

Figure 17 Individual Confidence Analysis of three Settings

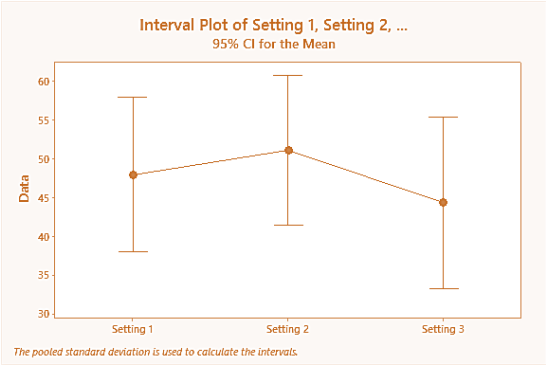

Figure 18 Group Confidence Analysis of three Settings

Pooled individual confidences point to a statistically significant difference whereas pooled group confidence is not significantly different when three settings analysed. Pooled individual confidence of Setting 2 and Setting 3 are statistically significant; $t_{26} = -3,65$ $p < 0.01$. Other pairs came out to be statistically not significant. This difference between Settings 2 and 3 can be a result of advice taking time. Since within Setting 3, individuals receive advice and adjust their confidence accordingly; within Setting 2 advice is received after completion of individual decision making session. But if this was the only reason, same difference should be visible also between Settings 1 and 3.

As a result of statistical analysis, slight accuracy improvements found between Setting 1, no-advice case, and Setting 2 and 3, with-advice cases, but difference is statistically not meaningful. Thus, the contribution of advice to the group decision making may be reasonable to further investigated.

Individual accuracy difference between Settings 1 and 2 has no meaningful pattern which can be associated with existence of advice. Since both settings receive no advice during individual decision making, mean individual errors were expected to be close. Reasons of this difference are also open to the questioning. Individual accuracy improvements can be seen for Setting 3 case where participants receive advice on individual decision making step. Whereas the highest standard deviation associated with the lowest absolute error may also point to high error ratings of the individuals damped when the errors are pooled.

Table 4 Summary of Statistical Findings

	Setting 1		Setting 2		Setting 3	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Individual Error	29.781	32.756	43.618	42.171	-8.054	169.638
Group Error	33.356	43.556	27.329	31.429	22.792	29.685
Individual Confidence	30.222	17.438	22.968	15.427	38.727	19.268
Group Confidence	47.981	23.469	51.171	21.688	44.354	24.656

All settings increased confidence 58.8% in Setting 1; 122.8% in Setting 2 and 14.4% in Setting 3 from individual to group steps which is also statistically not meaningful. Common pattern of the confidence ratings are, higher confidences expressed after receiving advice and after group discussion. Quickly increasing confidences, whereas limited or no improvement of accuracy can also be seen in this work in lined with the past researches (Sniezek and Buckley, 1995, Heath and Gonzalez 1995, Klayman et al., 1999, Soll & Klayman, 2004).

CHAPTER V

CONCLUSION

5.1. Limitations and Future Research

Major limitation of this work is representativeness of the sample. Industrial Engineering students whose answers are analysed were female dominated. Also age of the participants were pooled around 21 within a very narrow margin. More diverse set of participants in terms of age and background knowledge and balanced out gender can be more descriptive. If average age, years of education, gender or background knowledge (i.e. engineering vs. education students of universities) may be affective in terms of advice utilization or group confidence can be determined using a different pool of participants. Also diversity of the groups to be formed can be added as a dimension to the experiments.

This experiment is held as four sessions in the classroom after class meetings for the ease of reaching sufficient number of participants. An average of 45,75 students attended each session. High number of participants resulted reduced effectiveness of the experiment and caused loosing attention to the described procedure. As a result 45 participants (15 groups) excluded from the analysis. Since experimentation is held within the classroom, the participants could take a glance at other participants' answers disregarding the written and verbal remarks. Also some groups may be overheard other groups' discussions in consequence group decisions may be biased. A better experimentation could be held if groups of three scheduled to attend experiment separately and members to form the groups completed individual decision making step in isolation.

Research designed with a judgment task of dates of historical events. Thus choice tasks and scenario based decision making are other research areas to be investigated. Although historical events from various topics used, knowledge of participants did not evaluated before the experiment. Lack of this evaluation and random formation of groups causes a vague basis for analysis. For simplicity all

participants assumed to have same average knowledge of history. A better basis for analysis can be formed using pre-task-evaluation of historical knowledge of the participants.

Infrastructure of the experiment environment was not appropriate for video or sound recording. Thus discussion of individual answers and advices given could not be determined. To understand if advice given to an unstructured group will change perception of information, discussion process, domination within the group or formation of leadership behaviour; sound recording and expert evaluation of those recordings is crucial.

Variables that are effective during decision making processes of groups, such as "equity of participation, responsibility for the decision, leadership, power, consensus seeking and perception of information" as stated by Savadori and his colleagues (2001) and member satisfaction, homogeneous vs. heterogeneous groups in terms of background knowledge were out of the scope of this work. Also other considerations referring to advice taking literature are necessary to cover advice taking groups fully. Existence of a real advisor and evaluation of accuracy and stated confidence of the advisor, perception of expertise, trust formation within the group and group's trust in the advisor, reward power and on-going-relationship of group members and group to advisor (Van Swol and Sniezek, 2005, Sniezek and Van Swol, 2001) also research topics which can be adapted from judge advisor systems.

5.2. Conclusion

Within the scope of this thesis, extent to which an unstructured groups being affected by expert advice is investigated. For this aim, three different advice conditions applied to unstructured three-member groups. Since group decision making have different characteristics from individual decision making; it is expected that advice-taking unstructured groups to have different characteristics than both judge-advisor systems and unstructured groups in terms of accuracy and confidence.

Due to individual decision biases such as anchoring and adjustment (Tversky & Kahneman, 1974), egocentric advice discounting (Yaniv and Kleinberger, 2000) or egocentric bias (Krueger, 2003) as individuals and as groups people tend to discount advice heavily. Also as a matter of fact, groups increase their confidences after

receiving advice as a judge in a JAS (Heath & Gonzalez, 1995; Savadori et al., 2001) and also after making a group discussion. This confidence increase after taking advice and making a group discussion can be a result of superposition of finding a supporter to their idea (Harvey & Fischer, 1997) and pooling of exerted time and effort of all three-members (Kuhn, Spurlock, & Sniezek, 1998; Paese & Sniezek, 1991).

As conclusion, unstructured groups behave similar to groups structured as JAS in terms of accuracy improvement and confidence change in the face of advice (Sniezek and Buckley, 1995, Heath and Gonzalez 1995, Klayman et al., 1999, Soll & Klayman, 2004). Whereas this behaviour also visible at unstructured groups receiving no advice. Distinction between those cases and analysis of procedural and perception differences should be made with further researches.

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APPENDICES

APPENDIX A: QUESTIONNAIRE BOOKLETS

Information Sheet

Katılacağınız bu çalışma bireysel ve grup halinde karar verme, tartışma ve iletişim kurma eğilimlerini araştırmayı amaçlamaktadır. Bu çalışma iki adıma ayrılmış olup ilk yirmi soru bireysel olarak ikinci yirmi soru üç kişilik gruplar halinde cevaplanacaktır. Grup oluşturulmasında çalışma sorumlusunun talimatlarını takip ediniz.

Lütfen aşağıdaki bilgileri doldurunuz:

Yaş: ……

Cinsiyet: Kadın ☐ Erkek ☐

Eğitim durumu: Üniversite öğrencisi ☐ Sınıf: ……

Üniversite mezunu ☐

Diğer (Belirtiniz) ☐ ……

Katılımcı numarası: …… (Çalışma sorumlusu dolduracaktır)

Individual Decision Making Sheet

Bireysel Çalışma Adımı

Aşağıda 20. Yüzyıldan sonra gerçekleşen önemli olaylarla ilgili 20 genel kültür sorusu bulunmaktadır. Lütfen **bireysel** olarak çalışınız ve yıl bazındaki cevaplarınızı yanında "cevap" yazan kutucuğa doldurunuz. Değerlendirme yazan kutucuğun yanına ise biraz önce vermiş verdiğiniz cevaptan ne kadar emin olduğunuzu belirten 0%(***kesinlikle emin değilim***) ile 100%(***kesinlikle eminim***) arasında bir yüzde giriniz.

Örnek:

Kristof Kolomb Amerika kıtasını hangi yılda keşfetmiştir?

Cevap:	*1600*	Değerlendirme:	*75%*

1. Halley kuyruklu yıldızı en son hangi yılda dünyadan görülmüştür?

Cevap:		Değerlendirme:	

2. New York'taki Dünya Ticaret Merkezi'ne iki uçağın çarpmasıyla düzenlenen terörist saldırının tarihi (yıl) nedir?

Cevap:		Değerlendirme:	

3. İnsan genom projesi hani tarihte başlamıştır?

Cevap:		Değerlendirme:	

4. İlk başarılı klonlama (koyun Dolly) hangi yılda yapılmıştır?

Cevap:		Değerlendirme:	

5. Gürcistan, Özbekistan ve Türkmenistan hangi yılda Birleşmiş Milletler'e üye olmuştur?

Cevap:		Değerlendirme:	

6. Berlin Duvarı hangi yılda yıkılmaya başlandı?

Cevap:		Değerlendirme:	

7. Çernobil Nükleer Enerji Santralindeki kaza hangi yılda yaşandı?

Cevap:		Değerlendirme:	

8. Dünya'nın en uzaktan resmini çeken Voyager I, kaç yılında fırlatıldı?

Cevap:		Değerlendirme:	

9. Dr. Christiaan Barnard tarafından Louis Washkansky'e yapılan ilk insan kalp nakli operasyonu hangi tarihte (yıl) gerçekleştirildi?

Cevap:		Değerlendirme:	

10. ABD Başkanı John F. Kennedy hangi yılda suikast sonucu öldürüldü?

Cevap:		Değerlendirme:	

11. İlk insan yapımı uzay aracı Sputnik-1 hangi yılda yörüngeye fırlatıldı?

Cevap:		Değerlendirme:	

12. Apple CEO'su Steve Jobs'un doğum tarihi (yıl) nedir?

Cevap:		Değerlendirme:	

13. Everest Dağı'na ilk kez Edmund Hillary ve Tenzing Norgay'ın ayak bastığı tarih (yıl) nedir?

Cevap:		Değerlendirme:	

14. ABD'nin 2.Dünya savaşı sırasında Hiroşima ve Nagazaki'ye atom bombası attığı yıl nedir?

Cevap:		Değerlendirme:	

15. 2. Dünya Savaşı sırasında Almanya Fransa'ya hangi yılda saldırmıştır?

Cevap:		Değerlendirme:	

16. Çarlık Rusyası'nın yıkılarak Sovyetler Birliğinin kurulduğu tarih (yıl) nedir?

Cevap:		Değerlendirme:	

17. Birinci Dünya Savaşı döneminde Almanya, Rusya ve Fransa'ya hangi yılda savaş ilan etti?

Cevap:		Değerlendirme:	

18. İlk Berlin olimpiyatı kaç senesinde yapılmıştır?

Cevap:		Değerlendirme:	

19. Vietnam savaşı hangi yıl bitmiştir?

Cevap:		Değerlendirme:	

20. RMS Titanic isimli ünlü gemi hangi yılda batmıştır?

Cevap:		Değerlendirme:	

Group Decision Making Sheet

Katılımcı numarası: ……

Grup Çalışması Adımı

Aşağıda 20. Yüzyıldan sonra gerçekleşen önemli olaylarla ilgili 20 genel kültür sorusu bulunmaktadır. Lütfen **grupça tartışarak** olarak çalışınız ve yıl bazındaki cevaplarınızı yanında "cevap" yazan kutucuğa doldurunuz. Değerlendirme yazan kutucuğun yanına ise biraz önce vermiş verdiğiniz cevaptan ne kadar emin olduğunuzu belirten 0%(***kesinlikle emin değilim***) ile 100%(***kesinlikle eminim***) arasında bir yüzde giriniz.

Örnek:

Kristof Kolomb Amerika kıtasını hangi yılda keşfetmiştir?

Cevap:	*1600*	Değerlendirme:	*75%*

1. Halley kuyruklu yıldızı en son hangi yılda dünyadan görülmüştür?

Cevap:		Değerlendirme:	

2. New York'taki Dünya Ticaret Merkezi'ne iki uçağın çarpmasıyla düzenlenen terörist saldırının tarihi (yıl) nedir?

Cevap:		Değerlendirme:	

3. İnsan genom projesi hani tarihte başlamıştır?

Cevap:		Değerlendirme:	

4. İlk başarılı klonlama (koyun Dolly) hangi yılda yapılmıştır?

Cevap:		Değerlendirme:	

5. Gürcistan, Özbekistan ve Türkmenistan hangi yılda Birleşmiş Milletler'e üye olmuştur?

Cevap:		Değerlendirme:	

6. Berlin Duvarı hangi yılda yıkılmaya başlandı?

Cevap:		Değerlendirme:	

7. Çernobil Nükleer Enerji Santralindeki kaza hangi yılda yaşandı?

Cevap:		Değerlendirme:	

8. Dünya'nın en uzaktan resmini çeken Voyager I, kaç yılında fırlatıldı?

Cevap:		Değerlendirme:	

9. Dr. Christiaan Barnard tarafından Louis Washkansky'e yapılan ilk insan kalp nakli operasyonu hangi tarihte (yıl) gerçekleştirildi?

Cevap:		Değerlendirme:	

10. ABD Başkanı John F. Kennedy hangi yılda suikast sonucu öldürüldü?

Cevap:		Değerlendirme:	

11. İlk insan yapımı uzay aracı Sputnik-1 hangi yılda yörüngeye fırlatıldı?

Cevap:		Değerlendirme:	

12. Apple CEO'su Steve Jobs'un doğum tarihi (yıl) nedir?

Cevap:		Değerlendirme:	

13. Everest Dağı'na ilk kez Edmund Hillary ve Tenzing Norgay'ın ayak bastığı tarih (yıl) nedir?

Cevap:		Değerlendirme:	

14. ABD'nin 2.Dünya savaşı sırasında Hiroşima ve Nagazaki'ye atom bombası attığı yıl nedir?

Cevap:		Değerlendirme:	

15. 2. Dünya Savaşı sırasında Almanya Fransa'ya hangi yılda saldırmıştır?

Cevap:		Değerlendirme:	

16. Çarlık Rusyası'nın yıkılarak Sovyetler Birliğinin kurulduğu tarih (yıl) nedir?

Cevap:		Değerlendirme:	

17. Birinci Dünya Savaşı döneminde Almanya, Rusya ve Fransa'ya hangi yılda savaş ilan etti?

Cevap:		Değerlendirme:	

18. İlk Berlin olimpiyatı kaç senesinde yapılmıştır?

Cevap:		Değerlendirme:	

19. Vietnam savaşı hangi yıl bitmiştir?

Cevap:		Değerlendirme:	

20. RMS Titanic isimli ünlü gemi hangi yılda batmıştır?

Cevap:		Değerlendirme:	

Çalışma bitmiştir. Katılımınız için teşekkür ederiz.

	Questons	Date	error between actual and single grp	Setting 3 advices			absolute errors			mean absolute error of min,mid,	Setting 2 advices
				min	mid	max	min	mid	max		
1	Halley kuyruklu yıldızı en son hangi yılda dünyadan görülmüştür?	1986	-6	1979	1982	1993	7	4	7	6	1992
2	New York'taki Dünya Ticaret Merkezi'ne iki uçağın çarpmasıyla düzenlenen terörist saldırının tarihi (yıl) nedir?	2001	-5	1994	2000	2007	7	1	6	5	2006
3	İnsan genom projesi hani tarihte başlamıştır?	2000	8	1990	2005	2010	10	5	10	8	1992
4	İlk başarılı klonlama (koyun Dolly) hangi yılda yapılmıştır?	1996	7	1989	2000	2005	7	4	9	7	1989
5	Gürcistan, Özbekistan ve Türkmenistan hangi yılda Birleşmiş Milletler'e üye olmuştur?	1992	7	1983	1989	2000	9	3	8	7	1985
6	Berlin Duvarı hangi yılda yıkılmaya başlandı?	1989	-5	1983	1986	1995	6	3	6	5	1994
7	Çernobil Nükleer Enerji Santralindeki kaza hangi yılda yaşandı?	1986	6	1979	1984	1996	7	2	10	6	1980
8	Dünya'nın en uzaktan resmini çeken Voyager I, kaç yılında fırlatıldı?	1977	6	1970	1979	1987	7	2	10	6	1971
9	Dr. Christiaan Barnard tarafından Louis Washkansky'e yapılan ilk insan kalp nakli operasyonu hangi tarihte (yıl) gerçekleştirildi?	1967	-5	1961	1970	1973	6	3	6	5	1972
10	ABD Başkanı John F. Kennedy hangi yılda suikast sonucu öldürüldü?	1963	-6	1955	1961	1971	8	2	8	6	1969
11	İlk insan yapımı uzay aracı Sputnik-1 hangi yılda yörüngeye fırlatıldı?	1957	6	1949	1959	1965	8	2	8	6	1951
12	Apple CEO'su Steve Jobs'un doğum tarihi (yıl) nedir?	1955	-5	1947	1954	1961	8	1	6	5	1960
13	Everest Dağı'na ilk kez Edmund Hillary ve Tenzing Norgay'ın ayak bastığı tarih (yıl) nedir?	1953	-8	1945	1948	1963	8	5	10	8	1961
14	ABD'nin 2.Dünya savaşı sırasında Hiroşima ve Nagazaki'ye atom bombası attığı yıl	1945	6	1939	1948	1955	6	3	10	6	1939
15	2. Dünya Savaşı sırasında Almanya Fransa'ya hangi yılda saldırmıştır?	1940	5	1933	1940	1948	7	0	8	5	1935
16	Çarlık Rusyası'nın yıkılarak Sovyetler Birliğinin kurulduğu tarih (yıl) nedir?	1917	-6	1908	1917	1927	9	0	10	6	1923
17	Birinci Dünya Savaşı döneminde Almanya, Rusya ve Fransa'ya hangi yılda savaş ilan etti?	1914	-6	1906	1916	1922	8	2	8	6	1920
18	İlk berlin olimpiyatı kaç senesinde yapılmıştır?	1936	7	1926	1933	1943	10	3	7	7	1929
19	Vietnam savaşı hangi yıl bitmiştir?	1975	6	1968	1973	1983	7	2	8	6	1969
20	RMS Titanic isimli ünlü gemi hangi yılda batmıştır?	1912	-7	1903	1917	1920	9	5	8	7	1919

APPENDIX C: TURKISH SUMMARY

Karar verme işlemi bireysel olarak ya da bir grup insanla koordinasyon halinde tamamlanabilir. Modern hayatın karmaşıklığı ve karar verme sürecinde gerek duyulan bilgilerin çeşitliliği, kararın sorumluluğu bireysel olsa bile karar verme sürecinde başkalarının fikirlerini almak kaçınılmazdır. Bir doktorun bir tanı koyarken meslektaşlarına danışması ya da bir üniversite mezununun bir iş teklifi karşısında ailesinin fikrini alması günlük sıradan tavsiye alma/verme örnekleridir. Ayrıca sıklıkla sonuçtan grup olarak sorumlu olduğumuz kararlar da veririz. Bir işveren tarafından toplanarak iş için en uygun çalışanı tutmakla sorumlu bir iş görüşmesi jürisi, karar alma gruplarına örnek olabilir.

Bu tezde "heterojen olarak bilgilendirilmiş grupların tavsiye ile nasıl karar aldıkları" sorusu üzerinde durulmuştur. Bu soruyu cevaplamak için, tavsiye alma/verme ve grup kararı alma konusundaki literatür geniş bir perspektifle incelenmiştir. Bu tez konusu "Bireylerin bir tavsiye ile nasıl karar aldıkları" ile "Küçük grupların nasıl karar aldıkları" sorular birlikte düşünülmüştür. Bu iki sorunun da ortak noktası "karar verme"dir; dolayısıyla temel kaide "İnsanlar (bireysel olarak) nasıl karar verir?" sorusudur. Giriş kısmının devamı ve Literatür araştırmaları kısmında, bu soruların cevapları ve bulguları sunulacaktır.

Grupların nasıl karar verdiğini araştırmak için, öncelikle grubun ve karar vermenin ne olduğunu tanımlamamız gerekmektedir. Kararın sözlük anlamı; Oxford Çevrimiçi Sözlüğü'nde 'bir değerlendirmeden sonra ulaşılan sonuç ya da çözüm' olarak tanımlanmıştır. Bir karar vermek için, bireyin durumu değerlendirmesi, muhakeme etmesi gerekmektedir. Dolayısıyla, bu çalışmanın ve insanın yaşam boyu verdiği kararların başlangıç noktası, muhakeme etmektir. Muhakeme etmek, Oxford Çevrimiçi Sözlüğü'ne göre 'değerlendirerek karar verme ve mantıklı sonuçlara ulaşma yetisi' olmaktadır. Eğer muhakeme etmek bir bilginin değerlendirilmesi olarak tanımlanırsa, bu işlemin sonucu karar olacaktır.

İnsanların karar verme işlemleri için ekonomik mantıksal karar verme modeli, bir müşterinin kullanışlılık/fiyat ilişkisini nasıl algıladığını formüle etmek için kullanılır. Bu modele göre, bir birey benzer ailedeki tüm ürünler arasından en yüksek kullanışlılık/fiyat oranını veren ürünü tercih edecektir. Bu model, ulaşılırlık, beğenme, tercih ve sınırlı kaynak veya zamanı dikkate almamaktadır. Dolayısıyla, bireylerin

rutin karar verme prosedürleri ile tutarlı değildir. Simon (1982), insanların “sınırlı rasyonel canlılar olduklarını, dolayısıyla bilişsel yeteneklerimiz, kaynaklar ve zamanla sınırlandırıldığımızı söylemektedir. Bilişsel yapımız evrimle şekillenmiş, böylece en hızlının yaşamını sürdürebildiği bir şekle bürünmüştür.

Tversky ve Kahneman (1974) sınırlı insan zihninin sınırlı bilişsel kapasitesi sonucu tek bir ipucu ile nasıl yanlış yönlendirilebileceğine odaklanmıştır. Buldukları üç yöntem olan, temsil edilebilirlik, uygunluk ve referans noktalı yol, bir eylem planının çözümlenmesi için telafi edici olmayan yöntemlerdir. Tüm bu stratejiler en uygun çözüme ulaşmak için yeterli olmadığından dolayı, bu stratejileri kullanan bireylerin kararları temel alınmıştır.

Daha sonra Gigerenzer ve Todd (1999) bu hızlı karar alma stratejilerini “hızlı ve kanaatkâr bulgu” olarak isimlendirmiştir. Gündelik bulgular, işe giderken ne giymeli ya da kafeteryada nerede oturmalı gibi, aksi hali yüksek bilişsel efor harcamaya neden olan karar işlemlerinde zaman ve efor tasarrufu sağlar. Bu perspektiften yola çıkarak Gigerenzer ve arkadaşları (1999) günlük yaşamda kullandığımız minimalist, en iyiyi al ve an sonuncusunu al stratejilerini belirlemişlerdir.

Günlük basit kararlarımızda geniş bir strateji yelpazesi kullandığımız halde, göz önünde bulundurulacak ipuçlarının sayısı artıp, durum karmaşıklaştıkça bu stratejilerin uygunluğu da azalmaktadır. Bununla birlikte, çözümlerin uyumluluğu, “hızlı ve kanaatkâr” olmalarından daha önemli olabilmektedir. Bu durumlarda bireylerin grup oluşturma ve bilişsel eforlarını birbirlerine bağlayarak daha iyi bir sonuç almaya çalıştıkları görülmektedir.

Bir grup insanın bir karardan sorumlu tutulması durumlarında, farklı değişkenler ortaya çıkmaktadır. Gruptaki her birey aynı karar stratejisini uygulamak için, örneğin ulaşılabilirlik, uğraşsa da uygun seçenek algısının ve bireyler arası etkileşimlerin farklılığı varacakları sonuçları şekillendirecektir. Bireylerin üzerindeki gruba uyma baskısı, grubun muhakemesi yanlış olsa da grup kararını onaylama yönünde karar almalarına neden olacaktır (Asch; 1952).

Bir örgüt içerisinde, karar verme takımları çoğunlukla girdilerin belirsiz, çıktıların doğrudan bir çözüm sunmadığı ya da çıktı kalitesinin kolaylıkla değerlendirilemediği çözülmesi güç problemler için kurulmaktadır (Hart, 1985). Böylesi durumlarda,

takımlar ortak bir amaç için birden fazla bireyden oluşan topluluk olarak tanımlanabilir. Takım üyelerinin örgüt için iyi bir hareket planına ulaşmasını sağlayacak ortak bir çaba harcaması beklenir.

Bir grup ya da çalışma takımı kurulmasının amacı genellikle zorlu problemlerin çözümlerine farklı uzmanlık alanları veya çeşitli bakış açıları ile ışık tutmak, bu sayede de etkinliği artırmaktır. Çalışma gruplarındaki çeşitlilik, aslında iki ucu keskin bir bıçaktır (Mannix ve Neale, 2005). Bu gruplardan beklenilen gelişmiş sorun çözme yeteneği, bireylerin etkisizleşmesi ya da grup içinde oluşan sosyal çatışmalar sonucu engellenebilir (Örn. Besedes et al., 2014).

Çalışma ortamı düşünüldüğünde, çalışma takımlarının daha üretici, yenilikçi, sonuca daha yakın ve en önemlisi de şirket için her türlü olumlu durumu geliştiren yapılar olması beklenir. Bir göreve odaklanan daha fazla insan kaynağı yüksek maliyetli olmasına rağmen, aynı göreve atanan tek bir bireyden daha fazla etkinlik beklenmektedir (Festinger, 1954). Fakat etkinliğe etki eden tek faktör çalışma grubu/takımı içerisindeki birey sayısı değildir.

Grup performansına etki eden bir başka etmen de grubun yapısıdır. Örgütlü gruplarda işçiler için genellikle farklı özelliklerde ve hiyerarşide bulunan iş tanımları yer alır. Farklı hiyerarşik sınıfların karışımıyla oluşan bir karar verme grubunda bile grup üyeleri daha önceden belirlenen statülerine uygun davranmaktadırlar. Bir yönetici ya da lider ile bu kişiye rapor ya da destek veren altlarından oluşan bir gruba "hakem – danışman sistemi" denilmektedir (Sniezek ve Buckley, 1995), ve ilerleyen kısımlarda ayrıntılı olarak tanımlanacaktır. Eğer grup aynı hiyerarşik seviyeden gelen bireylerden oluşuyor ve karar verme sorumluluğu kişiler arasında paylaşılıyorsa, bu gruplara yapılandırılmamış gruptur.

Vroom ve Yetton modeli bu örgüt içi karar verme mekanizmasını bireysel karar verme mekanizmasından (Otokratik I olarak adlandırmaktadır), yapılandırılmamış grup karar verme mekanizmasına (Grup II olarak adlandırmaktadır) uzanan beş farklı yapıda tanımlar. Bu sınıflandırmada JAS yapısı (Otokratik II, Danışmanlı I ve Danışmanlı II olarak adlandırılır) bu iki durum arasında yer alır (Vroom & Yetton, 1973). Bu sınıflandırma, daha sonraki araştırmacıların bulduğu yapılandırılmamış gruplar ve hakem-danışman sistemlerinin birbirlerinden sosyal baskılar, sonuç hakkında sorumluluk hissi ve grubun ya da bireylerin ellerindeki bilgi algıları gibi pek

çok prosedürel ve sonuç değişkenleri ile ayrıldıklarını gösterdiği için önemlidir (Savadori et al. 2001; Van Swol, 2009; Van Swol & Ludutsky, 2007).

Bazı durumlarda elimizdeki bilgi bir sonuca ulaşmak için yeterli değildir. Böyle şartlar altında başkalarının bilgi ve tavsiyelerine başvururuz. Bu uygulamalar gelecek kısımda başvurulmuş olan öneri alma literatürü içinde araştırılmıştır.

Öneri alma ve başkalarının fikirlerine yönelme, karar verme işlemi sırasında sıkça başvurulan bir uygulamadır. Bireyler önerilere pek çok gerekçe ile başvurmakta ve ödeme yapmaktadır. Harvey ve Fischer'a göre (1997) bir öneriyi kabul etmek için üç önemli gerekçe karar kalitesini geliştirmek, sonucun sorumluluğunu paylaşmak ve ücretsiz tavsiyeyi reddetmekte isteksiz olmaktır. Bireysel olarak, karmaşık gerçek yaşam problemlerine karşı zayıf hissedebiliriz, bunun sonucunda güvendiğimiz birisini arar ve bizi yanlış seçimlerin sonuçlarından korumalarını umarız. Karar verme amacıyla örgüt içi grupların oluşması işlemi ayrıca sonuç kararın daha iyi olmasını da sağlar.

Bireyler için öneri alma sürecinde farklı kaynaklardan alınan öneriler, farklı önem seviyelerine ya da ağırlıklarına sahiptir. Büyükanneniz ve bir meteoroloji uzmanı yağmurun yağacağı konusunda fikir ayrılığında bulunduğunda, büyükanneniz ile uyumlu olup yanınıza şemsiyenizi alırsınız; çünkü büyükanneniz akşam yemeği ödülünün gücüne sahiptir. Van Swol ve Sniezek (2005) işlem süresince insanların etkilendiği önem ağırlığı değişkenlerini sunmuştur. Bunlar "hakemin danışmana güveni, danışmanın güvenirliği, danışmanın hatasızlığı, hakemin danışman ile daha önceki ilişkisi ve hakemin danışmana ödeme yapabilme gücü"dür (Van Swol ve Sniezek, 2005, Sniezek ve Van Swol, 2001).

Önerinin kullanımı ve değerlendirme stratejileri JAS literatürü içinde geniş bir şekilde araştırılmıştır. Kullanımın derecesini belirlemek için kullanılan formül temelli ölçümler "öneri alma" (Harvey ve Fischer, 1997), "önerinin değeri" (Yaniv, 2004b) ve "kendi tahminin önemi" (Yaniv ve Kleinberger, 2000)'dir.

Genellikle bir öneri almanın hedefi iyi bir eylem planı oluşturmak ve eylem planından emin olmak olsa da, öneri alma uygulamalarının sonuçları son kararın kesinliği ve karar hakkındaki güven oranıdır. Öneri kullanımının seviyesi gibi, kesinliği ve güvenilirliği de pek çok faktöre bağlıdır. Kesinlik ile başlamak gerekirse, öneriyi

sunan kişinin kesinliğine karşı öneri alan kişi oldukça duyarlıdır. Eğer görev belirli bir süre içinde gerçekleşir ve geri dönüşü de bildirilirse, (Fischer ve Harvey, 1999) ya da aykırı sonuçların da bulunduğu bir öneri havuzu oluşturulabiliyorsa (Harries et al.,2004) hakem kişi sonuç tutarlılığına bağlı olarak verdikleri değeri yeniden gözden geçirirler.

Danışmanlar ve hakem kişiler tarafından verilen güven değerleri de önemli ilişkilere sahiptir. Hakem kişinin danışmanın değerini ölçebildiği tek ipucunun kendileri tarafından verilen değer olduğu bir deney tasarımının içinde, danışmanın güvenilirliği, kesinliği belirlerken önemli bir değer haline gelir (Price ve Stone, 2004) ya da hakem kişileri danışmanın fikirlerine göre manipüle edici olabilir (Van Swol, 2009).

Bir kararı tamamlamadan önce, insanlar pek çok şey yapabilir. Alternatif yollar hakkında bilgi almak amacıyla internette araştırma yapabilir, güvenilir birine danışabilir ve en sonunda elde edilen tüm veriyi kendi bakış açılarında toplayabilirler. Bu işlem problemin önemine ve karmaşıklığına dayanarak çeşitlenir. Buna benzer başka bir işlem de gruplar tarafından bir karar/fikir konsensüsü oluştuğunda verilmektedir. Grup üyeleri bir konu hakkındaki fikirlerini öne sürerler, birlikte ya da tek başlarına araştırma yaparlar ve sonuçta başarılı bir karar konsensüsüne ulaşırlar.

Bu tezin amacı öneri bulunduğunda grupların nasıl karar konsensüsü oluşturduğunu anlamaktır. Öneri kullanımı ve güvenoyu değişimi JAS'a mı, yoksa yapılandırılmamış grupla mı ilişkilidir? Bu amaçla literatür taraması içerisinde, bireysel karar verme mekanizması üzerinde durulacaktır. Daha sonra alınan önerinin kullanılması, elenmesi ve güven konseptinin genel tekrarı yapılacaktır. Hakem danışman sistemleri ve sistem içindeki değişkenleri araştırılacaktır. Grup karar verme mekanizmaları, dinamikleri ve yapılandırılmamış grup – JAS kıyaslaması araştırılarak bilgi algısının sonuçları belirtilecektir.

Bu çalışmada, birbirlerinden öneri alma yapısına bağlı farklılıkları olan üç deney ortamı hazırlanmıştır. Tüm katılımcılar son yüz yıl içinde gerçekleşmiş olan yirmi tarihi olayın gerçekleştikleri yılları önce bireysel, daha sonra ise üç kişilik gruplar halinde cevapladıkları bir teste tabi tutulmuşlardır. Ortam 1'e katılmış olan katılımcılar ne bireysel ne de grup karar alma adımlarında herhangi bir öneri

almamışlardır. Bu ortam literatürde yapılandırılmamış grup karar verme prosedürü olduğu için (Keyton, 1999; Savadori et al., 2001; Van Swol, 2009) deney içindeki analizler için temel çizgi olacaktır. Ortam 2 ve Ortam 3'te öneriler Ortam 2 için grup karar verme adımında, Ortam 3 için ise bireysel karar verme adımında verilmiştir. Bu yolla ilki başlangıç önerili (Harvey ve Fischer, 1997; Yaniv, 2004b; Yaniv ve Kleinberger, 2000), ikincisi ise başlangıç önerisiz (Harvey et al., 2000; Van Swol & Sniezek, 2005; Budescu et al., 2003) iki farklı JAS yapısı sağlanmaya çalışılmıştır.

Ortam 2 ve Ortam 3 için gerekli öneriler olayların gerçek tarihlerini çeşitlendiren bir randomizasyon kuralı ile hazırlanmıştır (Fischer ve Harvey, 1999). Katılımcıların aynı oranda etkilenmesini sağlamak için Ortam 2 "Soru 1" için verilen önerinin mutlak hata ortalaması, Ortam 3 "Soru 1" için verilen üç önerinin mutlak hata ortalamasına eş tutulmuştur. Önerilerin gerçek tarihten ortalama sapmasının da toplam kesinlikte mümkün olduğunca sıfıra yakın tutularak, önerilerin rastgele ve herhangi bir grubun avantajına olmaması sağlanmıştır (Özarslan, 2014).

Her ne kadar önerilerin kabulü katılımcılar arasında değişse de, öneriler hakkında ortak algının oluşması amacıyla katılımcılara, önerilerin konusunda uzman bir kişiden geldiği söylenmiştir. "Uzman" belirtecinin öneriler için kullanılması, uzman ve uzman olmayan danışman farklılığını ortadan kaldırmak amacıyla araştırmacıların daha önceden kullandığı bir yöntemdir (Goldsmith ve Fitch, 1997; Jungermann ve Fischer, 2005).

138 katılımcıdan toplanan, doğruluk ve özgüvene dayalı veriler oturum içi ve oturumlar arası şartlarda karşılaştırılmıştır. Oturum 1'de 48 katılımcı, Orutum 2'de 51 katılımcı ve Oturum 3'te de 39 katılımcı istatistiki yöntemler kullanılarak analiz edilmiştir. En çok kullanılan öneri kullanım ölçümleri olan önerinin ağırlığı (Yaniv, 2004b) ve kişisel tahmin ağırlığı (Yaniv ve Kleinberger, 2000) ayrıca hesaplanmış olsa da, eldeki veriler desteklendirilmemiş olduğu için bu ölçmeler veri setine uygulanabilir bulunmamıştır. Desteklenen veriler İlk yanıt (I) < Son yanıt (F) < Öneri (A) ya da numerik yanıtlar çalışıldığında A < F < I olmalıdır. F < A <I ve I < A < F durumlarında, hedef aşımı görülür ve WoA ve WoE karşılaştırılabilir sonuçlar veremez.

Öncelikle, en çok kullanılan öneri kullanım ölçekleri olan önerinin değeri (Yaniv, 2004b) ve kendi tahminin değeri (Yaniv ve Kleinberger, 2000) ayrıca hesaplanmıştır.

ÖD ve KTD hesaplamaları, ilk önce cevap verip, daha sonra öneri alarak en son final cevabı alınma prosedürünün uygulandığı tek ortam olan Ortam 2'de tutulmuştur. Her soru için başlangıç cevabı olarak üç bireysel cevabın ortalaması, final cevabı olarak da grup cevabı alınmıştır.

Sonuç olarak, Oturum 2 ortalamaları WoA = 2.1499 (SS = 3.0453) ve WoE = 1.867 (SS = 3.193) olarak ölçülmüştür. Veriler hedef aşımı yaşanan cevaplar içerdiği için, WoA ve WoE sonuçları veri analizinde kullanılmaya uygun değildir.

İki grubun aynı soruya verdiği cevaplar Tablo 3'te görülebilir. Gruplar final cevaplarını bazen öneriye uygun şekilde bazen de tersi yönde düzeltmişlerdir. Grupların cevapları genel olarak ele alındığında, iki durumun da eşit sıklıkta görüldüğü gözlemlenmiştir.

Daha sonra demografik yapılarına göre gruplarda baskın bireyin bulunup bulunmadığı kontrol edilmiştir. Bu analiz için birey cevabına eşit olan grup cevapları sayılmıştır. Gruplar içinde, bir bireyin cevabı diğer iki bireyin cevapları toplamından daha fazla yer almaktaysa, o bireyin grubunu domine ettiği kabul edilmiştir. On yedi grubun içinde sekiz grupta baskın karakter görülmektedir.

Beş kadın ve üç erkek grubunu domine etmiştir. Baskın bireylerin yaş ortalaması 22,4'tür; yaş ortalaması katılımcı yaş ortalamasının üstünde olsa da, sadece iki grupta grubun en yaşlı bireyi oldukları görülmektedir. Cinsiyet, sınıf ya da yaş cinsinden herhangi bir baskınlık etkisi göstermemektedir.

Ortam 2 içinde grup kararı için verilen önerilerin karşılaştırması, neredeyse tüm grupların verilen öneriden farklı düşündüklerini göstermektedir. Dolayısıyla öneri kullanımı Ortam 2 içinde düşüktür.

Grup kararına verilen öneriler ile bireysel kararlara verilen önerilerin Ortam 3'teki karşılaştırılması, neredeyse tüm grupların hem bireysel hem de grup karar verme adımlarında belirgin şekilde öneriden uzak durduklarını göstermektedir. Bu durum, Ortam 3'ün öneri kullanımının düşük olduğunu vurgulamıştır.

İstatistiksel analizler sonucu, Ortam 1, önerinin bulunmadığı durum, Ortam 2 ve Ortam 3, önerilerin kullanıldığı gruplar arasında küçük kesinlik gelişimleri bulunsa da, bu farklılıkların istatistiksel olarak anlamsız oldukları söylenebilir. Dolayısıyla,

önerilerin grup karar verme mekanizmalarına etkisi üzerine daha ayrıntılı bir araştırma yapmak mantıklı olacaktır.

Ortam 1 ve Ortam 2 arasındaki bireysel kesinlik farkı önerinin bulunması ile ilişkilendirilebilecek mantıklı bir düzen sunmamaktadır. Her iki ortamın da bireysel karar verme adımları sırasında her hangi bir öneri almadıkları göz önünde bulundurulursa, ortalama bireysel hataların birbirlerine yakın olmaları beklenmektedir. Oluşmuş olan fark da farklı bir tartışmaya açıktır. Ortam 3'te ise, bireysel karar verme adımında önerilerin bulunması nedeniyle bireysel kesinlik gelişimleri görülmektedir. Ayrıca en düşük mutlak hata ile ilişkili en yüksek standart sapmanın görülmesi de, bireylerin yüksek hata oranlarının hataların toplanması sırasında düştüğünü göstermektedir.

Bireysel karar verme adımından, grup adımına geçildiğinde ise tüm ortamların güven oranlarını Ortam 1 için %58,8, Ortam 2 için %122,8 ve Ortam 3 için %14,4 oranında artmış olduğunu göstermektedir ki bu durum da istatistiksel olarak anlamlı değildir. Güven oranlarındaki genel düzenler, öneri ve grup tartışması ile verilen cevaplarda daha yüksek güven oranlarının bulunduğunu göstermektedir. Güven arttığı halde sınırlı miktarda artan ya da artmayan kesinlik daha önceki çalışmalarda da görülmüştür (Sniezek ve Buckley, 1995; Heath ve Gonzalez, 1995; Klayman et al., 1999; Soll ve Klayman, 2004).

Çalışmanın en önemli sınırlaması örneklem grubunun temsil edebilirliğidir. Cevapları analiz edilen Endüstri Mühendisliği öğrencileri kadın ağırlıklıdır. Ayrıca katılımcı havuzunun yaş ortalaması da 21 olmakla birlikte çok dar bir marja sıkışmıştır. Yaş ve genel kültür açısından daha geniş bir yelpazede bulunan ve cinsiyet açısından daha eşit bir denek grubu daha açıklayıcı olabilir. Ortalama yaş, eğitim süresi, cinsiyet ve bilgi altyapısı (örn. Mühendislik öğrencileri – Eğitim öğrencileri) gibi şartların tavsiye kullanımı ya da grup özgüveni konusundaki etkileri farklı bir katılımcı havuzu kullanılarak belirlenebilir. Ayrıca grupların çeşitliliğinin sağlanması ile deneye yeni boyutlar kazandırılabilir.

Bu çalışma yeter sayıda katılımcıya ulaşmanın kolaylığı açısından ders saatlerinden hemen sonra 4 bölümde yapılmıştır. Her bölüme ortalama 45.75 öğrenci katılmıştır. Yüksek katılımlar, belirtilen prosedüre dikkatin düşmesine neden olduğu için düşük etkinliğe yol açmıştır. Sonuç olarak 45 katılımcı (15 grup) prosedürlere uymama

nedeniyle analizlerden çıkarılmıştır. Deney sınıf ortamında yapıldığı için, bazı katılımcılar, diğer katılımcıların cevaplarına göz atma imkânı bulmuş olabilir. Ayrıca bazı gruplar da yazılı ve sözlü uyarılara dikkat etmeyerek diğer grupların tartışmalarını duymuş veya cevaplarını görmüş olabilirler. Üçlü grupların randevu usülü gelip katıldığı uzun süreli ve birbirlerinden yalıtıldığı bir deney düzeneği uygulanması halinde daha sağlam sonuçlara ulaşılacaktır.

Araştırma tarihi olayların tarihlerini tahmin etme üzerine tasarlanmıştır. Dolayısıyla seçenekli görevler ve senaryo temelli karar verme araştırmaları, araştırma yapılabilecek diğer düzenekleri oluşturabilir. Her ne kadar olaylar çok çeşitli konular üzerine odaklansa da, deney öncesi katılımcıların tarihi bilgileri değerlendirilmemiştir. Bu değerlendirmenin eksikliği ve grupların rastgele kurulması analiz için belirsiz bir temel yaratmıştır. Basitçe tüm katılımcıların aynı ortalama tarih bilgisine sahip oldukları kabul edilmiştir. Daha temelli bir analiz için katılımcıların test öncesi tarih bilgisi testine tabi tutularak tarih bilgileri değerlendirilebilir.

Deney ortamı görsel ya da sesli kayıt alınmasına uygun olmadığı için kayıt alınmamıştır. Dolayısıyla bireysel cevaplar ve önerilerin tartışmaları belirlenememiştir. Yapılandırılmamış bir gruba verilen önerinin, grubun bilgi algısı, tartışma işlemleri, grup içi baskın eleman ya da liderlik davranışı gelişimi durumları üzerine etkilerini anlamak için ses kaydı ve bu kayıtların bir uzman tarafından değerlendirilmesi çok önemlidir.

Grupların Savadori ve arkadaşlarının belirttiği gibi (2001) karar verme işlemlerini etkileyen “katılım eşitliği, karar sorumluluğu, liderlik, uzlaşma arayışı ve bilgi algısı” gibi değişkenler ve grup üyelerinin tatmini, bilgi birikimi açısından homojen – heterojen gruplar bu çalışmanın yaklaşımı dışında bırakılmıştır. Ayrıca öneri alan grupları tam anlamıyla kavrayabilmek için karar alma literatürü ile ilgili diğer kaynaklar da göz önünde bulundurulmalıdır. Gerçek bir danışmanın bulunması ve danışmanın özgüven ve tutarlılık değerlendirmeleri, uzmanlık alanı, grup ile güven ilişkileri ve oluşturulan karşılıklı güven, ödüllendirme gücü ve grup üyelerinin birbirleri ile ve grubun danışman ile ilişkileri (Van Swol ve Sniezek, 2005; Sniezek ve Van Swol, 2001)hakem – danışman sistemlerinden uyarlanabilecek diğer araştırma konularıdır.

Bu tez ışığında, yapılandırılmamış grupların uzman görüşleri tarafından etkilenmeleri araştırılmıştır. Bu amaç için, üç farklı öneri durumu yapılandırılmamış üç kişilik gruplara uygulanmıştır. Grup karar verme mekanizması özellikleri bireysel karar verme mekanizması özelliklerinden farklı oldukları için, öneri alan yapılandırılmamış grupların hem hakem danışman sistemlerinden, hem de yapılandırılmamış gruplardan kesinlik ve güven konularında farklı olmaları beklenmiştir.

Referans noktalı ve uyarlamalı bireysel karar verme önyargılarına bağlı olarak (Tversky ve Kahneman, 1974), benmerkezci önerilerin yok sayılması (Yaniv ve Kleinberger, 2000) ya da benmerkezci önyargıların (Kruger, 2003) bireysel ve grupsal etkileri atıldığında bireylerin önerileri ağırlıklı olarak yok saydıkları görülmektedir. Ayrıca gerçek şudur ki, gruplar JAS sistemlerinde hakem iken bir öneri aldıklarında (Heath ve Gonzalez, 1995; Savadori et al., 2001) ve ayrıca bir grup tartışması yaptıklarında güvenleri artmaktadır. Öneri aldıklarında ya da grup tartışması yaptıktan sonra yaşanan bu güven artışı, bireylerin kendi fikirleri ile uyuşan başka bir fikrin desteğini almaları (Harvey ve Fischer, 1997) ve gruptaki her üç üyenin harcadığı çaba ve zamanın aynı havuzda toplanması (Kuhn, Spurlock ve Sniezek, 1998; Paese ve Sniezek, 1991) sonucu oluşmuş olabilir.

Sonuç olarak, yapılandırılmamış gruplar, öneriler sonucu hedeflerindeki gelişim ve güven artışı konularında JAS yöntemi ile oluşturulan gruplara benzerlik göstermektedirler (Sniezek ve Buckley, 1995; Heath ve Gonzalez, 1995; Klayman et al., 1999; Soll ve Klayman, 2004). Hâlbuki bu davranış hiçbir öneri almayan yapılandırılmamış gruplarda da görülmektedir. Bu iki durum arasındaki fark ve prosedürel ve algı farklılıklarının analizleri, daha ileri araştırmalar yapılarak gözlemlenmelidir.

APPENDIX D: TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü ☐

Sosyal Bilimler Enstitüsü ☐

Uygulamalı Matematik Enstitüsü ☐

Enformatik Enstitüsü ☐

Deniz Bilimleri Enstitüsü ☐

YAZARIN

Soyadı: ÖZER

Adı: NERGİZ

Bölümü: İŞLETME BÖLÜMÜ

TEZİN ADI (İngilizce) :

TEZİN TÜRÜ: Yüksek Lisans ☐ Doktora ☐

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir. ☐
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir. ☐
3. Tezimden bir bir (1) yıl süreyle fotokopi alınamaz. ☐

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: