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Naturalistic Decision Making: Original Research on Experience and Personality Traits of Child Services Professionals

Doğal Karar Verme Mekanizmaları: Çocuk Hizmetleri Profesyonellerinin Deneyim ve Kişilik Özellikleri Üzerine Özgün Araştırma

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ABSTRACT Objective: The focus on decision making research has moved from rational decision-making processes to naturalistic decision making since it investigates how people make decisions in real life settings. For field professionals working with children, it is often very difficult to use rational decision-making styles due to the ever-changing social world and interactions, rather than the physical world. For this reason, decision making styles of field professionals working with children have been explored. Also it was inteded to provide an insight about factors such as empathy, anxiety and stress that might affect decision making styles. **Material and Methods:** One hundred eighty-eight field professionals working with children and adolescents were recruited for the study. Participants read scenarios and filled out forms to determine their decision-making styles and personality traits. **Results:** The findings revealed that participants employing rational decision-making styles have higher accuracy in scenarios and experience levels in terms of years significantly affects the accuracy. In terms of personality traits empathy has an effect on both rational and naturalistic decision-making styles. **Conclusion:** Naturalistic decision-making abilities of individuals are due to situations that are recognized by them in accordance with the literature. These abilities lead individuals to recognize schemas and patterns and also to perform mental simulations. It can be concluded that the pattern recognition partly constitutes intuitiveness, while mental simulations constitute the rational part.

Keywords: Naturalistic decision making; intuitive thinking style; experience; age; personality traits

ÖZET Amaç: Karar verme araştırmalarında ilgi odağı, insanların gerçek yaşam ortamlarında nasıl karar verdiklerini araştırmaktır. Bu nedenle alandaki araştırmalar, rasyonel karar verme süreçlerinden doğal karar verme süreçlerine taşınmıştır. Özellikle çocuklarla çalışan alan profesyoneller için fiziksel dünyadan ziyade, sürekli değişen sosyal dünya ve etkileşimler nedeni ile rasyonel karar verme stilleri kullanmak genellikle çok zordur. Bu nedenle bu araştırma kapsamında çocuklar ile çalışan alan profesyonellerinin karar verme stilleri incelenmiştir. Buna ek olarak karar verme stillerini etkileyebileceği düşünülen empati, kaygı ve stres gibi faktörler araştırılmıştır. **Gereç ve Yöntemler:** Çalışmaya çocuk ve ergenlerle çalışan 188 alan profesyoneli katılmıştır. Katılımcılar karar verme tarzlarını ve kişilik özelliklerini belirlemek için senaryoları okumuş ve çeşitli formlar doldurmuşlardır. **Bulgular:** Araştırma sonuçlarına göre rasyonel karar verme stilleri kullanan katılımcıların, senaryolarda daha yüksek tutarlılığa sahip oldukları görülmüştür. Ayrıca yıllar açısından deneyim seviyelerinin tutarlılığı önemli ölçüde etkilediğini ortaya koymuştur. Kişilik özellikleri açısından bakıldığında ise empatinin hem rasyonel hem de doğal karar verme stilleri üzerinde etkili olduğu görülmüştür. **Sonuç:** Bu araştırmanın sonucunda bireylerin doğal karar verme yeteneklerinin, literatüre uygun olarak kendileri tarafından tanınan durumlardan kaynaklandığı görülmüştür. Bu yetenekler, bireylerin şemaları ve kalıpları tanımasına ve ayrıca zihinsel simülasyonlar yapmasına yol açar. Elimizdeki veriler ışığında örüntü tanımanın kısmen sezgisellik kısmından etkilendiği, zihinsel simülasyonların ise rasyonel kısmı oluşturduğu sonucuna varılabilir.

Anahtar Kelimeler: Doğal karar verme; sezgisel düşünme tarzı; deneyim; yaş; kişilik özellikleri

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Every day people make decisions in various situations. The nature of decision making varies depending on the subject on demand. Choosing a restaurant to eat on a regular basis may be a quick decision but occasions such as medical decisions about serious health problems or buying a house occurs rarely in a lifetime, the decision making process takes longer than simpler decisions.[1] Decision making is a complex process and individuals deploy several techniques to achieve a conclusion. In their study, Scott and Bruce proposed four major decision styles: (i) rational decision making style, (ii) intuitive decision making style, (iii) dependent decision making style and (iv) avoidant decision making style.[2] The current research concentrated mostly on rational decision-making styles. In this decision-making style, people first become aware of the problem at hand and try to generate alternative solutions for it. They weight every option carefully and finally identify the best option for the problem.[3] Since the process begins with the identification of the problem, it can easily be affected by personal factors. In the related literature, factors such as age, gender, and personality have been widely investigated.

Researchers suggest that as age increases people get wiser therefore, people are thought to be more experienced and get more organized with knowledge. But in terms of decision making processes; some related skills can weaken with age while some can remain the same or even get better.[4] Additionally, age has a reported various effect on decision making processes and styles. Previous studies were unable to find age-related differences in decision making process, while others reported differences related to age.[5-11] Gender studies also reported contradicting results on decision-making processes and styles. While some researchers reported no differences among genders, some detected these differences in subscale levels.[12-14] Research on personality focused on unraveling the connection between personality types and decision-making styles. Hitherto, most of the studies focused to establish the connection in terms of big 5 personality trait theory and reported a connection between rational thinking styles and conscientiousness as well as agreeableness. Intuitive thinking styles are positively related to extroversion and openness to experience.[15,16] Other studies focused on subscales of personality such as self-efficacy and self-esteem. Nygren and White's study showed that people combining both rational and intuitive thinking styles can be considered as best decision makers from a self-efficacy perspective.[17]

These traditional decision-making processes and their conditions are not ideal for real-life situations. For this reason, decision making research extended to real world complex tasks and systems being operated by individuals in their natural setting.[18] The study of Naturalistic Decision Making (NDM) was started to investigate how people make decisions in real life settings.[19] Researchers tried to understand how people make accurate decisions under difficult conditions such as limited-time, uncertainty, high stakes, vague goals, and unstable conditions. The results revealed that under these conditions, people can use their prior experience in order to recognize situations and to reach a final decision.[20] Klein and Klinger described these strategies in his "Recognition-Primed Decision-Making Model". According to this model, there are 3 stages of recognition. In the first and the simplest stage, the situation is acknowledged, and the obvious reaction is applied. In somewhat more complex cases, where the decision-maker consciously evaluates the reaction, the decision-maker typically uses imagining to foresee problems before executing it. In the most complex cases, the assessment uncovers imperfections, which requires alteration or the judgment about the option is adequate and it is rejected for the following most common response.[21] Although the level of experience of decision-makers is a key component of NDM, the complex reasoning that occurs in natural situations is not sufficient to explain it. Decision-makers also need to learn from previous difficult situations and asked to differ from their original action plan, and this information needs to be incorporated into their mental models.[22] For this reason, NDM both contains intuitive and rational components of decision making. While pattern recognition can be identified as the intuitive component, mental simulations can be considered as the rational part.[20] In the last decade the NDM research has extended to forensic sciences, social work, medicine, military, fire department and sports.[23-25] For the professionals working with children,

decision making process mostly concerns social world and individual interaction rather than the physical world. Also, the constantly changing factors in social world might or might not be relevant to the cases they are working on. For these reasons rational decision making might not fit into social world realities. Therefore, NDM might be a better approach. The present study aims to explore decision making styles of field professionals (psychologist, sociologist, social workers) working with children. For this purpose, the main hypothesis of this research is that experienced field professionals will mostly employ Naturalistic Decision Styles and will have more accurate decisions about provided scenarios. Also, this study seeks to provide an insight about factors such as empathy, anxiety and stress that might affect decision making styles.

MATERIAL AND METHODS

ETHICS

This study has been approved by the Ethical Committee of İstanbul University-Cerrahpaşa Faculty of Medicine (date: October 10, 2017, no: 59491012-604.01.02). The study was carried out in accordance with the Principles of the Helsinki Declaration.

RESEARCH DESIGN

The grounded theory approach was used in this study. In this approach, systematically gathered data is analyzed in order to generate a general methodology.[26] This approach was chosen since it was aimed to shed a light onto the decision-making processes and personal traits of the field professionals.

PARTICIPANTS

One hundred eighty-eight (52 males, 36.50±9.23 yrs.) field professionals (psychologist, sociologist, social workers) working with children and adolescents at the Department of Justice, Education and Domestic Affairs were recruited for the study. The participants were informed about the purpose of the study, and those who agreed to participate signed an informed consent form.

MATERIALS

The participants answered questions after reading three scenarios about fictional child abuse and neglect. These 3 scenarios were generated by field and academic professionals and presented to the participants in order to detect whether they recognized the situation at question. The scenarios were thoroughly generated to evaluate the main aspect of situation assessment; the "pattern recognition" of which two of them required notification to the authorities. The participants also filled out personal information form, State-Trait Anxiety Inventory (STAI-X), Perceived Stress Scale, Basic Empathy Scale, Rational-Intuitive Thinking Styles Inventory.

PROCEDURE

The required documents were filled online or delivered to the participants on hard copy. The participants first read the 3 scenarios and made rapid decisions about notifying the authorities about child neglect and/or abuse. After reading the scenarios the participants were asked to fill abovementioned forms.

STATISTICAL ANALYSES

Statistical Package for Social Sciences 24 (IBM Corp., Armonk, NY, USA) was used for data analyses. Following the normality tests; Mann-Whitney U test was used to determine the relationship between correct answer scores and thinking styles. Kruskal-Wallis tests were used to determine the relationship between demographic variables and thinking styles. Spearman correlation analysis was applied to determine the relationship between thinking styles and personality variables.

RESULTS

This study examined the relationship between decision making styles and personality traits among field professionals.

DEMOGRAPHIC INFORMATION

The descriptive statistics of demographics and test scores are given at Table 1. Only 46% of male and 49% of female participants were adopting intuitive thinking styles. Analyses showed no significant relationship between rational and intuitive thinking styles and gender (p=0.937; p=0.072).

ACCURATE ANSWERS ANALYSES

Three scenarios were presented to the participants in order to detect whether they recognized the situation

TABLE 1: Descriptive statistics of demographics and test scores.

		Frequency	Percent	Valid percent	Cumulative percent
Age	20-30 yrs	58	30.9	30.9	30.9
	31-40 yrs	62	33	33	63.8
	41-50 yrs	59	31.4	31.4	95.2
	50 and above	9	4.8	4.8	100
Gender	Male	52	27.7	27.7	27.7
	Female	136	72.3	72.3	100
Experience	0-5 yrs	49	26.1	26.1	26.1
	6-10 yrs	41	21.8	21.8	47.9
	11-15 yrs	28	14.9	14.9	62.8
	16-20 yrs	33	17.6	17.6	80.3
	21-25 yrs	29	15.4	15.4	95.7
	26-30 yrs	6	3.2	3.2	98.9
	31-35 yrs	2	1.1	1.1	100
Previous notification history	Yes	79	42	42	42
	No	109	58	58	100
Decision making styles	Rational	97	51.6	51.6	51.6
	Intuitive	91	48.4	48.4	100

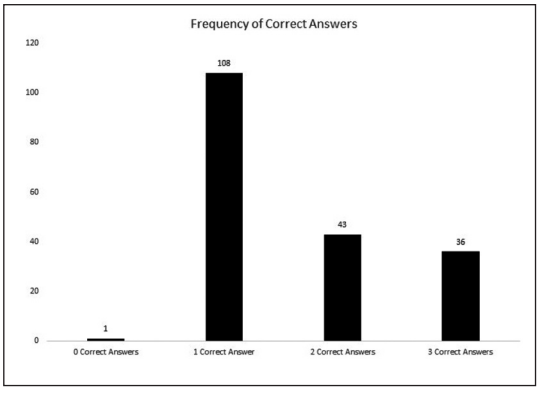

FIGURE 1: Frequency of Correct Answers.

at question. They were expected to report two of these situations to the authorities. Points calculated according to participants' accuracy. Distribution of the scores and answers to scenarios are presented in Figure 1 and Table 2. For the given scenarios, 35.6%, 97.3% and 27.7% of the participants answered correct respectively. Only 19.1% of the participants was able to identify situations correctly in the presented scenarios.

Frequency of correct answers and demographics have also been analyzed and the results are presented in Table 3. A Kruskal-Wallis test showed that the experience levels in terms of years significantly affects

TABLE 2: Distribution of the answers according to the scenarios.

		Frequency	Percent	Valid percent	Cumulative percent
Scenario 1	Correct	67	35.6	35.6	35.6
Notification required	Wrong	121	64.4	64.4	100.0
Scenario 2	Correct	183	97.3	97.3	100.0
Notification not required	Wrong	5	2.7	2.7	2.7
Scenario 3	Correct	52	27.7	27.7	27.7
Notification required	Wrong	136	72.3	72.3	100.0

TABLE 3: Analyses of Kruskal-Wallis test results in the correct answer scores and demographics variables.

		n	Mean of ranks	SD	χ^2	p value
Age	20-30 yrs	58	107.37	9.7	3	0.021
	31-40 yrs	62	80.31			
	41-50 yrs	59	97.53			
	51 and above	9	89.44			
Experience	0-5 yrs	49	116.09	19.245	6	0.004
	6-10 yrs	41	81.45			
	11-15 yrs	28	75.25			
	16-20 yrs	33	92.53			
	21-25 yrs	29	101.48			
	26-30 yrs	6	87.25			
	31-35 yrs	2	55.5			

SD: Standard deviation.

the accuracy scores (χ^2 (6)=19.25, p=0.04). The results of the Bonferroni post-hoc test showed that 20-30 age group has higher correct answers than 31-40 age group (p=0.013). Also 0-5 years of experience group has higher correct answers than 6-10- and 11-15-years variables of experience group (p=0.015, p=0.008). No such significant differences have been observed in terms of gender and previous notification history variables.

Correct answers score and thinking styles have been analyzed. The results indicated that correct answers score was significantly higher for participants with rational thinking styles than participants with intuitive thinking styles (U=3718.5, p=0.036). Further analyses have been performed in order to determine possible relationship between thinking styles scores and correct answer scores and no significant correlations were found among variables.

THINKING STYLES AND PERSONALITY VARIABLES

In order to determine possible relations between thinking styles and personal factors Spearman correlation coefficients were calculated. The results are presented in Table 4. Spearman's rho revealed a statistically significant positive relationship between the intuitive thinking styles and empathy scores (r=0.159, p=0.029). Also, statistically significant positive relationship was found between intuitive thinking styles and experience level in terms of years (r=0.163, p=0.025). Rational thinking styles have found to be negatively related to empathy scores, perceived stress and anxiety levels respectively (r=-0.183, p=0.012; r=-0.276, p=0.000, r=-0.152, p=0.037).

DISCUSSION

The present study aimed to explore decision making styles of field professionals (psychologist, sociologist, social workers) working with children. For this purpose, three scenarios were generated by field and academic professionals and presented to the participants in order to detect whether they recognized the situation at question. Also, the participants were asked to fill out personal information form and Rational-Intuitive Thinking Styles Inventory in order for us to understand their thinking styles. In addition, STAI-X, Perceived Stress Scale, Basic Empathy Scale were completed to determine the possible relationship with decision making styles and factors such as empathy, anxiety and stress. The results of this study revealed that only 46% of male and 49% of female participants were adopting intuitive thinking styles but no significant relationship was determined between decision-making styles and gender. In the related literature, gender studies focusing on decision

TABLE 4: Means, standard deviations, and correlations with confidence intervals.

Variable	$\bar{X}$	SD	Rational thinking		Intuitive thinking	
1. Rational thinking style	59.55	7.438				
2. Intuitive thinking style	41.09	7.449	0.086	0.243		
3. Anxiety	34.59	9.578	-0.152*	0.037	-0.121	0.098
4. Perceived stress	23.00	7.719	-0.276*	0.000	-0.103	0.159
5. Empathy	57.95	6.235	-0.183*	0.012	0.159*	0.029
6. Experience (years)	12.35	8.12	-0.059	0.422	0.163*	0.025

SD: Standard deviation. * p<0.05

making mechanism have contradicting results. Taşdelen investigated the decision-making styles and related variables among prospective teachers and no gender differences were reported.[14] On the other hand, Kuzgun reported that males are more likely to adapt impulsive decision making styles while Tiryaki reported opposite findings.[8,27] Likewise, employing rational and intuitive decision making among genders has contradicting results.[12,28] Also previous research suggested that females pay more attention to possible loses, social pressure and emotions than males.[13]

According to findings in this study, as age increases individuals are more likely to employ intuitive decision-making styles. In the related literature some researches did not report any significances between age and decision-making styles.[5-8] On the other hand, other researchers reported differences related to age suggesting that age may have an positive effect on different domains of decision-making processes.[9-11] Considering the results in the related literature, it can be assumed that participants in this study tend to employ intuitive decision-making styles if the situation is familiar. Also, the increasing number of accurate results with age can be explained with the increased knowledge.

Also, one of the hypotheses was that with experience participants will more like to employ intuitive decision-making style. The results revealed statistically significant positive relationship between intuitive thinking styles and experience level in terms of years (r=0.163, p=0.025). Also, it has been found that the experience levels in terms of years significantly affects the accuracy scores ($\chi^2(6)=19.25$, p=0.04). Collins and Daly reported that when there are limited evidence social workers tend to use their previous experience to decide.[29] In the related literature it has been reported that people use their prior backgrounds in decision making processes. The findings of this study support these results since a positive correlation have been detected between intuitive decision-making style and experience levels. The increase in knowledge also affects the relationship between accurate answers and experience levels.

Another hypothesis was people who employ naturalistic decision styles and will have more accurate decisions about provided scenarios. When the data were investigated, a significant relationship has been found between rational thinking styles scores and correct answers score. Further analyses have shown that only 42% of the participants have prior child neglect/abuse reporting. Also mean of these reported cases are only 2.41. From these results it can be concluded that low accuracy in decisions can be related to failing to recognize familiar situations as proposed in Naturalist decision styles. In the related literature it has been reported that the more people become experienced the more they employ NDM styles.[30,31] All of the aforementioned studies used face-to-face semi-structured interviews. The required documents used in this study have been filled out online or delivered to the participants on hard copy. So, it was unable to identify the underlying mechanism in decision making styles. Also it has been concluded that providing conditions such as limited-time, uncertainty, high stakes, vague goals, and unstable conditions would affect the results. Finally, naturalistic decision-making style contains intuitive and rational components of decision making.[20] The tendency to use rational decision-making styles can be considered as part of NDM.

All in all, in this study it was aimed to provide an insight about factors such as empathy, anxiety and stress that might affect decision making styles. The results revealed a statistically significant positive relationship between the intuitive thinking styles and empathy scores (r=0.159, p=0.029). Rational thinking styles have found to be negatively related to empathy scores, perceived stress and anxiety levels respectively (r=-0.183, p=0.012; r=-0.276, p=0.000, r=-0.152, p=0.037). In the related literature it has been reported that stress directly related to lack of control and self-confidence can negatively affect judgement.[32] Anxiety and stress reported to activate fight or flight response in humans which have an negative effect on working memory and cognitive processes.[33] The relationship between rational thinking styles, stress, and anxiety can be explained with negative affect on systematical scanning of all the options, evaluating them, seeking for alternatives and solutions. A very few number of researches about intuitive decision making and empathy report that these

two concepts are related since the process of empathy concerns with understanding patterns, possibilities, and hunches that are typical for intuitive decision making and causes accuracy in position that requires empathy.[34,35] The negative relationship with rational decision making and positive relationship with intuitive decision making can be explained in this sense.

CONCLUSION

The main hypothesis of this research was that experienced field professionals would often use natural decision-making mechanisms when making decisions compared to inexperienced professionals. According to these findings; field professionals working with children often had rational thinking styles. However, a positive relationship was found between intuitive thinking style with experience level and age. Also it has been determined that the accurate responses of the individuals were also affected by age and experience.

In the light of these data, it can be concluded that the natural decision-making abilities of individuals are due to situations that are recognized to them in accordance with the literature. In naturalistic decision-making mechanisms, individuals need to recognize schemas and patterns and also need to perform mental simulations. The pattern recognition partly constitutes intuitiveness, while mental simulations constitute the rational part. In this context, it can be concluded that the tendency of rational thinking is also part of the natural decision making processes.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

***Idea/Concept:** İpek Ergönül Hürman, Neylan Ziyalar; **Design:** İpek Ergönül Hürman, Neylan Ziyalar; **Control/Supervision:** İpek Ergönül Hürman, Neylan Ziyalar; **Data Collection and/or Processing:** İpek Ergönül Hürman; **Analysis and/or Interpretation:** İpek Ergönül Hürman, Neylan Ziyalar; **Literature Review:** İpek Ergönül Hürman; **Writing the Article:** İpek Ergönül Hürman; **Critical Review:** İpek Ergönül Hürman, Neylan Ziyalar.*

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