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Interactional Coding System (ICS) as a Data Collection Tool for Observing Couples' Problem-solving Interactions

Çiftlerin Problem Çözme Etkileşiminin Gözlenmesinde Bir Veri Toplama Aracı Olarak Etkileşimsel Kodlama Sistemi (EKS)

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ABSTRACT

The aim of this research is to introduce the Interactional Coding System (ICS), adapted to Turkish culture in order to observe couples' problem-solving interactions. Within the scope of the study, the results of some empirical studies using ICS have been compiled and some ideas about future studies are presented. In ICS, behaviors that occur during the interaction are coded simultaneously in two dimensions as verbal and non-verbal. There are three categories for both verbal and nonverbal behaviors: positive, negative, and neutral. During the ICS adaptation process, 25 married couples were studied. The video recordings of three randomly selected couples were encoded by two separate encoders. The Kappa coefficient was found to be .88 ($p < .001$) for verbal codes and .81 ($p < .001$) for non-verbal codes. This showed that the study is a very reliable study for coders.

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ÖZET

Bu araştırmanın amacı, çiftlerin problem çözme etkileşimlerini gözlemlemek amacıyla Türk kültürüne uyarlanan Etkileşimsel Kodlama Sisteminin (EKS) tanıtılmasıdır. Çalışma kapsamında EKS'nin kullanıldığı bazı ampirik araştırmaların sonuçları derlenmiş ve ileride yapılabilecek çalışmalarla ilgili bazı fikirler sunulmuştur. EKS'de, etkileşim sırasında ortaya çıkan davranışlar, sözel ve sözel olmayan olmak üzere iki boyutta eş zamanlı olarak kodlanırlar. Hem sözel hem de sözel olmayan davranışlar için, pozitif, negatif ve nötr olmak üzere üç kategori bulunmaktadır. EKS uyarlama sürecinde 25 evli çift ile çalışılmıştır. Rastgele seçilen üç çiftin video kayıtları iki ayrı kodlayıcı tarafından kodlanmıştır. Kappa katsayısının sözel kodlar için .88 ($p<.001$) ve sözel olmayan kodlar için .81 ($p<.001$) olduğu görülmüştür. Bu da çalışmanın kodlayıcılar açısından oldukça güvenilir bir çalışma olduğunu göstermiştir.

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INTRODUCTION

Due to its multidimensional and complex nature, marriage involves many potential problems. There are research results are indicating that some communication problems and a lack of communication skills lie behind the problems encountered by couples in marriage (Greef & Bruyne, 2000; Cramer, 2000). Likewise, Hahlweg (2004) states that most of couples resort to family therapy for reasons such as a lack of communication and problem-solving skills. For this purpose, various communication skills training were developed all over the world (Kaiser, Hahlweg, Fehm-Wolfsdorf & Groth, 1999; Silliman & Schumn, 2004), it was aimed to solve the relationship problems of the couples through the training. The basic assumption of problem-solving and communication skills training is that the speaking and listening skills that couples use during their communication skills are quite effective on the general communication level. Couples with speaking and listening skills can easily use skills such as using I-language, describing specific situations and behaviors, being here and now, active listening, interpreting, asking open-ended questions, giving positive feedback. Couples who lack of these skills, on the other hand, try to disrupt communication, such as blaming, criticizing, diverting the issue, and finding excuses. The skills that couples use during their communication determine the quality of their interactions (Hahlweg & Conrad, 1983).

Researchers emphasized that couples should be observed directly in order to truly understand close relationships and to reveal how couples cope with the problems they experience in marriage (Chambless, Fauerbach, Floyd, Wilson, Remen & Renneberg, 2002; Heymann, 2004; Floyd, 2004). Until recently, standard measurement tools were used to determine some characteristics or features of the couple relationship; These scales were frequently used in studies conducted with pretest and posttest experimental research designs with a control condition (Baucom & Kerig, 2004). How couples' marital problems are dealt with in terms of therapeutic is closely related to the development of couple and family therapy theories. Couple and family therapy, which was under the influence of the psychodynamic approach until the end of the 1960s, gained a new dimension with the behavioral therapy revolution in the 1970s. With the effect of behavioral couple therapies, how couples communicate with each other and, what behavioral patterns they use during communication has become important. In these years, researchers (Chambless et al., 2002; Heymann, 2004; Floyd, 2004) focused on observing how couples behave to each other during an interaction. They started coding the flow that emerged during the couple interaction by dividing them into certain categories and grading them. Thus, it has been possible to systematically observe complex human relationships and to classify the behaviors that occur during this observation.

There are several ways to learn about couple interaction. Undoubtedly, both standard tests and observational techniques are important data collection tools that give us important clues about couple behavior and support each other. Observational studies do not have superiority to standard tests, but by making a direct observation about the behavior of the couple, it is possible to reach some clues that cannot be reached with standard tests (Baucom & Kerig, 2004; Henry, Berg, Smith & Florsheim, 2007). Since a large number of couples are reached through standard tests, the results obtained can be generalizable and can be preferred for practicality. In addition, the extent to which couples' responses to scale questions or items reflects the actual situation is controversial due to the phenomenon of social desirability. However, there is an opportunity to determine the interaction between couples directly - through observation - without a measurement tool (Patterson, Reid & Dishion, 1992). The purpose of

this study is to introduce the Interactional Coding System, which is adapted to Turkish culture, as a data collection technique for observing couples' problem-solving interactions. Commonly used coding systems that focus on couple interaction in international literature are introduced in the next section.

Couple Interaction Coding Systems

Observational coding systems, which are based on cognitive behavioral theory, focus on the behavior of couples when they discuss a topic they see as a problem in their relationships. Thanks to the observational coding systems, it seems possible to test the effect of cognitive behavioral training given to couples (Baucom & Kerig, 2004). Therefore, it seems quite convenient to examine the effectiveness of cognitive techniques with observational category systems. Coding systems that were widely used in the literature in the 1970s and focused on the problem-solving interaction of couples are introduced below:

Marriage Interaction Coding System (MICS): MICS is the Family Interaction Coding System at the University of Oregon adapted to the couple relationship. In the following years, MICS has undergone various revisions (Heymann, 2004). With MICS, it is aimed to observe the problem-solving interactions of women and men in the marital relationships. For this purpose, couples are given a list of conflict areas. They are asked to identify a topic they can discuss. The couples try to find a solution by discussing the problem they have identified for 10-15 minutes. In the meantime, the couple's discussion is videotaped. And an encoder trained in this field scores the couple's behavior by watching the video through MICS. MICS has four main categories of behavior. These; hostility, humor, constructive discussion of the problem, and responsibility. In addition, each category is divided into sub-categories. MICS 'Humphrey, Apple and Kirschenbaum (1986) as a data collection tool; Malarkey, Kiecolt-Glaser, Pearl, and Glaser (1994); it appears to be preferred in the studies of Kiecolt-Glaser, Glaser, Cacioppo, MacCallum, Snydersmith, Kim, and Malarkey (1997).

Rapid Marital Interaction Coding System (RMICS): RMICS is an extension of the oldest and frequently used MICS (Marriage Interaction Coding System). Two more categories have been added to the fourth version of MICS. These; withdrawal and unpleasant mood. Thus, the coding system has become more comprehensive. RMICS, which is a life-based system, allows both couples to observe simultaneously. With this system, all observable behaviors (eg emotional, motor, linguistic) are coded. This system has been developed to measure the frequency of all behavior and behavioral patterns that occur during close couples' conflicts. The system is primarily used for married couples, as well as for adolescents, university students or engaged couples. The sample can be composed of undiagnosed married couples or patients with clinical diagnosis (cancer patients, substance addicts, etc.) (Heyman, Eddy, Weiss & Vivian, 1995; Heyman, 2004). Fyffe (2001); Crowell, Treboux, Gao, Fyffe, Pan, and Waters (2002); Kellas, Carr, Horstman, and Dilillo (2017) preferred to use RMICS in their studies.

An Observational Coding System for Capturing Social Processes (The MICSEASE): MICSEASE, a behavioral coding system, focuses on verbal behaviors that occur during the interactions of couples in a laboratory environment. The codes include verbal behaviors such as problem-solving, accepting responsibility, humor, mind reading, and complaining (Griffin, Greene & Decker-Haas, 2004). As a data collection tool, MICSEASE's Greene and Griffin (1998); It was observed that Wolchik, West, Sandier, Tein, Coatesworth, and Lengua (2000) and Griffin (2002) were used in their studies.

The Interactional Dimensions Coding System: **A Global System for Couple Interactions (ICDS):** The purpose of ICDS is to encode the positive and negative dimensions of the couple's interaction. The

system enables the emotion and content of the whole interaction to be revealed. ICDS, nine single codes (positive mood, negative mood, problem-solving skills, ability to influence the partner, support and approval, behaviors that encourage conflict, withdrawal, denial, communication skills) and five binary codes (negative uplift, positive elevation, commitment, satisfaction for the future, stability for the future. While the couples are evaluated separately in single codes; evaluated together in binary codes. The system is generally used to encode heterosexual couples to discuss problem areas in their relationships (Kline, Julien, Baucom, Hartman, Gilbert, Gonzalez & Markman, 2004). Markman, Renick, Floyd, Stanley, and Clements (1993) of this coding system; Paley, Cox, Burchinal, and Payne (1999); Stanley, Markman, Prado, Olmos-Gallo, Tonelli, St. It was seen that Peters (2001) preferred in his studies.

Communication Skills Test: Observational System for Couples' Problem-Solving Skills (CST): CST has been developed to evaluate the communication and problem-solving competencies of couples while solving relationship problems. The coding system focuses on the binary interaction process and the quality of the behaviors exhibited during problem-solving. This system is used for coding each change in speech. These changes are coded as highly positive (giving feedback, meta-communication) positive (empathy, humor), negative (irrational thinking, mixed speech) and neutral (asking questions, giving information) (Floyd, 2004). It was seen that the communication skills test was used in the studies of Floyd and Markman (1983) and Floyd (1988).

Observational Coding of Demand-Withdraw Interactions in Couples (CIRS): The coding system focuses on the processes of partners such as criticism, blame, desire-withdrawal, emotionality. The purpose of the system is to observe the frequency of these behaviors in couple interaction. CIRS is used to observe their relationship problems or discussions of individual issues (Sevier, Simpson, & Christensen, 2004). CIRS was preferred in the studies of Christensen and Heavey (1990), Walczynski (1997) and Eldridge (2000).

System for Coding Interactions in Dydas (SCID): System for Coding Interactions in Dydas is used to encode binary and individual behaviors that occur when couples discuss their problems. This system focuses primarily on the power and control dynamics in the couple relationship. In addition, it focuses on all behaviors related to relationship stability and relationship quality. SCID includes evaluating difficult behaviors such as verbal aggression, oppression, and control. It also includes evaluating the couple's behaviors and communication elements related to domestic violence and power dynamics in the relationship. These elements include concepts such as negative tension, conflict management style, and commitment (Malik, & Lindahl, 2004). Cohan and Kleinbaum (2002) and Lindahl and Malik (1999) preferred to use the Couple Interaction Coding System in their studies.

All these coding systems have some limitations. More detailed in explaining couple behaviors, summarizing behavior categories that gather each behavior category under their own roof, make the coding process more systematic. In addition, these coding systems do not provide the opportunity to encode verbal and non-verbal behavior separately. The Interactional Coding System, adapted into Turkish within the scope of this study, is classified in detail the behaviors that occur during communication. In this study, it is aimed to adapt the Interactional Coding System, to introduce and adapt it in detail, considering the limitations of the coding systems that were previously developed to observe the couple interaction and consider their improvement.

Interactional Coding System (ICS)

Under this title, after the purpose of the Interactional Coding System, its psychometric properties and the observation categories in the ICS are expressed with examples, the coding process and coding training are mentioned. Then, some study examples in which ICS was used and finally the process of adapting ICS to Turkish were mentioned.

Goal: ICS aims to reveal in detail the verbal and non-verbal behaviors of married couples that occur during problem-solving interaction (Hahlweg & Conrad, 1983). This coding system can also be used to evaluate the communication and problem-solving skills of couples receiving Behavioral Marriage Therapy and to test the effectiveness of the therapy process. This system not only provides the opportunity to observe the behavior of the couple, but also provides the opportunity to analyze family interactions, including more than two family members.

Psychometric Properties: In order to test the reliability of ICS, four video recordings randomly selected among a series of video recordings including the interactions of couples included in the study by Hahlweg (2004) were encoded by five separate encoders. The inter-coder reliability coefficient is .86 for verbal codes; it is calculated as .76 for non-verbal codes. In order to test the validity of ICS; differential validity and construct validity were checked. To test the differential validity, 41 couples were studied (n = 29 with problems, n = 12 without problems). According to this, problem-free couples have more non-verbal positive behavior, self-disclosure, acceptance, agreement, and problem identification than problematic couples; it has been observed that they use less nonverbal negative behavior, criticism, disagreement, excuse, and negative solution (Hahlweg & Conrad, 1983). For the construct validity, the structural compatibility of ICS with sexuality, marital quality, conflict scales were examined and studies showed the expected correlations. Thanks to its psychometric properties, ICS has become a preferred coding system in families and different cultures with a wide range of features from schizophrenia to asthma (Hahlweg, 2004).

Observation Categories: Verbal behaviors and subcategories of verbal behaviors in the ICS are presented in Table 1 (Hahlweg & Conrad, 1983).

As seen in Table 1, there are three categories for verbal behaviors in the Interactional Coding System: positive, negative, and neutral. In the positive verbal category, there are four basic behaviors, namely self-disclosure, positive resolution, acceptance, and agreement, and twelve categories in total, consisting of their sub-categories. There are four main and ten sub-categories under the negative verbal category: criticism, negative resolution, excuse, and conflict. Under the neutral verbal behavior category, there are three main categories as problem identification, meta-communication, and listening, and six sub-categories related to these. Behaviors that cannot be defined under any category are coded under the "Other" category.

Table 1. Verbal ICS categories

Category	Subcategories
Positive	
Self-disclosure (SD)	Expression of feelings (SDF) Expression of wishes and needs (SDW) Expression of attitudes, behavior (SDB)
Positive Solution (PS)	Specific, constructive proposal (PSP) Compromise suggestions (PSC)
Acceptance (AC)	Paraphrase (ACP) Open question (ACQ) Positive feedback (ACF) Understanding for the other (ACU)
Agreement (AG)	Direct agreement (AGD) Acceptance of responsibility (AGR) Assent (AGS)
Negative	
Criticize (CR)	Devaluation of partner (CRD) Specific (CRS)
Negative Solution (NS)	Destructive solution (NSD) Demand for omission (NSO)
Justification (JS)	Excuse of own behavior (JUB) Denying own responsibility (JUD)
Disagreement (DG)	Direct disagreement (DGD) Yes-but (DGY) Short disagreement (DGR) Blocking off (DGB)
Neutral	
Problem Description (PD)	Neutral description of the problem (PDD) Neutral Questions (PDQ)
Meta Communication (MC)	Clarifying requests (MCC) Related to topic (MCT)
Listening (LI)	Listening (LIS) Conversation pauses (LIP)
Rest Category (RC)	Rest category (RCC)

Another coding performed simultaneously with positive, negative, and neutral verbal categories is performed for non-verbal behaviors. Categories related to non-verbal behaviors in the Interactional Coding System are presented in Table 2.

Nonverbal behaviors, just like verbal behaviors, are encoded in three separate categories as positive, negative, and neutral. In addition, when coding these behaviors, attention is paid to the face, voice, and body cues in Table 2.

Tablo 2. Non-verbal ICS categories

	++ positive	+	- negative	- -
FACE				
Eyes	looking for ¾ of times as speaker	looking for ¾ of times as listener	not looking for ¾ of time or fixated look	looking away demonstratively or glaring
Mimic	smiling sympathetic	concerned	bored, frowning, sulking expression	sneering, angry, expression, disgusting, crying, anxious
Head	clearly nodding as listener	slightly nodding as listener	head shaking	clearly head shaking
VOICE				
	tender, lovable, warm, soft, relieved, interested, giggling, happy, pleased, laughing	-	monotonous, groaning, sharp, sulking, hesitating	cold, harsh, whining, anxious, afraid, staccato, lamenting, sarcastic, accusing, screaming, depressed, complainig, scornful laugh
BODY				
Arm, hands	touching	open arms	chenched hands, tense movements, hands covering the face, handling objects	threatening arm position, harsh, rude gestures, devaluating hand movements, abrupt, cutting off gestures
Seating	leaning forward to partner	mostly turning towards	mostly turning away	turning away demonstratively
Body	-	narrowing distance	moving away	moving nervously

Detailed explanations regarding the observation categories in the Interactional Coding System are as follows:

Self-disclosure: Expressing feelings under the category of self-disclosure; direct expression of wants and needs. There are three separate subcategories: direct expression of attitudes, thoughts, and behaviors.

1- Expressing of feelings: This category includes the verbal expression of all emotions that are qualified as positive and negative. These feelings express the speaker's current emotional experiences about the past, present, and future. Emotions can be expressed in nouns, verbs, and adjectives. It can express the physical and mental state. Expressions starting with "I" and expressing emotions in full are the reactions that make up this category.

2- Expressing of wishes and needs: The direct expression of wishes and needs is related to the present and the future, and is usually expressed with verbs such as want, desire, wish.

3- Expression of attitudes, behavior: Reactions related to this category are related to the present and the future, and these reactions explain the reason why the speaker is in a specific attitude, thought, and behavior.

Positive Solution: All opinions about the solution of a common problem fall under this category. These verbal responses should point out possible solutions to the problem. Solutions should be guiding, realistic and applicable for the future. This category is divided into two as constructive and compromises solutions.

1-Specific, constructive proposal: These suggestions contribute to the improvement of the problematic situation or to prevent the negative situation. These are suggested for now or the future and should be specific.

2- Compromise suggestions: It is a coding category in the event that couples come to an agreement with each other and reach a constructive agreement.

Acceptance: This category includes all behavioral patterns that show that the partner's situation is understood and accepted. Acceptance includes behaviors that express that the speaker puts himself in his partner's shoes and understands his partner's feelings and thoughts. This category includes subcategories of paraphrasing, relevant, and open questions, positive feedback, and understanding of the partner.

1- Paraphrase: It includes the reactions of the speaker to the understanding and acceptance of the situation or to be greeted with empathy.

2- Open question: It can be defined as dealing with the emotions and mood of the partner, and asking purposeful questions.

3- Positive feedback: Verbal reactions, compliments and positive evaluations given that the speaker is satisfied with something he said or done are collected under this heading.

4- Understanding of the other: Trying to care and understand the other partner's lives is coded in this category.

Agreement: All comments that are intended to be sent to the patent in positive ways are coded under this category. It has three subcategories: direct agreement, acceptance of responsibility, and approval.

1- Direct agreement: Contains sentences expressing that they think the same thing with the partner.

2- Acceptance of responsibility: It means that the person accepts his / her responsibility regarding any matter. Beforehand, the other partner implies that the person is not fulfilling his responsibility adequately.

3- Assent: They are short, clear, conciliatory expressions used by the speaker and are usually no longer than a few words. Expressions such as "ok", "yes", "absolutely correct" are collected in this category.

Criticize: It is divided into two sub-categories: specific criticism and devaluation of the partner.

1- Specific: A negative comment is coded as criticism, all reactions (relating to the past and present) to the rejection or condemnation of the partner's behavior.

2- Devaluation of partner: This category includes negative judgments of the partner through blaming, humiliating, and making unpleasant comments. The aim is to humiliate and humiliate the patner. It is general and is concerned with personality traits.

Negative Solution: It has a structure that suggests destructive changes and is divided into two: the demand for abandonment and the destructive solution.

1- Demand for omission: In this category, we can describe the restrictions the speaker imposes on the other person's doing certain things. These can be about the present or the future.

2- Destructive solution: This category includes unacceptable offers, whether actionable or obstructive. It arises during the discussion of a problem.

Justification: It means defending one's behavior. Explain the reason for the speaker's behavior. In this way, the speaker wants to show and confirm that his behavior is appropriate. Making excuses and denying responsibility are sub-dimensions of excuse behavior categories.

1- Excuse of own behavior: It means making an excuse for certain events.

2- Denying own responsibility: If the person does not feel responsible for a past or current problem, this situation is coded as an excuse.

Disagreement: All disagreement and rejection reactions about what the partner said are collected under this category. Conflict is divided into four sub-categories: direct or indirect dispute; yes but… rejecting sentences, blocking communication.

1-Direct disagreement: A negative answer after a question, questioning the accuracy of the content expressed, developing opposing thoughts or ignoring a request can fall under this category.

2- Yes, but ...: Although the beginning of the sentences contains an agreement, they express disagreement when looked at the whole.

3- Short disagreement: These are brief objections (no, what!) That contains the listener's doubts and disagreements about the truths of the speaker.

4- Blocking off: To interrupt the partner's speech and to react that will cause him to remain silent.

Problem Description: It means dealing with a general problem or defining a problem. It is possible for only one of the spouses to see a situation as a problem. These problems are related to situations that originate from coexistence or focus on solving problems. Problems, differing ideas; It is formed through the expectations and demands of life together. Under this category, either a problem is put forward or the problem is tried to be clarified with the questions asked. Therefore, two sub-categories emerge.

1- Neutral description of the problem: The problem can be defined in different ways. Namely, either a problem is assumed to exist; The nature of the problem and its possible causes are explained or the consequences of the problem related to the partners are discussed and the relationship is established with the future.

2- Neutral questions: These are the questions about the nature of the problem or about the suggestions for the problem. These are questions about ideas, thoughts, attitudes, and behaviors related to the topic under discussion.

Meta-communication: All speeches that go beyond the content and refer to the process, as well as the speaker, are coded under meta-communication. It has two subcategories: process adjustment and commitment.

1- Clarifying requests: This category includes reactions such as clarifying the subject or asking questions to solve instant problems and asking to repeat what was said.

2- Related to topic: It includes suggestions on the subject and recommendations for us to stick to the subject. It also motivates us to find a solution to the problem, but it does not include finding a solution to the problem.

Listening: This category was created to keep the reaction order steady for technical reasons. It is divided into two categories: listening and pausing.

1-Listening: If the speaker lines the behavior of more than one category one after the other, this category is used to encode the behavior of the listening person in order to ensure the transition between partners.

2- Conversation pauses: Pauses of 10 seconds or more are coded as a speech pause.

Other: Sentences coded in this category; are acoustically incomprehensible, unfinished, illogical and irrelevant sentences.

Non-verbal categories: The non-verbal behaviors of the speaker and the listening person are also coded in each observation unit. These are coded under positive (+), negative (-), and neutral (0) categories. There are three categories of response: face, voice, and body. The non-verbal behavior of individuals is determined by looking at the facial, voice and body cues.

ICS Observation Category Examples: Examples of positive verbal behavior categories in the Interactional Coding System are presented in detail in Table 3 (Hahlweg & Conrad, 1983).

Table 3. ICS positive verbal category examples

Category	Sub-category	Examples
Self-disclosure	Expression of feelings	I'm very angry listening to you right now.
	Expression of wishes and needs	I want to go to the football field tomorrow.
	Expression of attitudes, behavior	When I meet someone new, I am very calm.
Positive solution	Specific, constructive proposal	Let's create a list of our upcoming expenses.
	Compromise suggestions	If you play with the kids I can sweep the floor too.
Acceptance	Paraphrase	You say kids are too young to go to kindergarten?
		Are you still sad?
	Open question	I liked the way to start arguing.
	Positive feedback	You must be feeling sad right now.
	Understanding for the other	
Agreement	Direct agreement	Yes, true.
	Acceptance of responsibility	I was responsible for the discussion.
	Assent	Yes, ok.

Examples of negative verbal behavior categories in the Interactional Coding System are presented in detail in Table 4.

Examples of neutral verbal behavior categories in the Interactional Coding System are presented in Table 5.

Examples of non-verbal behavior categories in the Interactional Coding System are presented in Table 6.

Table 4. ICS negative verbal category examples

Category	Sub-category	Examples
Criticize	Devaluation of partner	You make me sick.
	Specific	I'm at home and the house is so messy, you haven't done anything!
Negative Solution	Destructive solution	If you're so unhappy, why don't you want to jump into the river and escape?
	Demand for omission	We can get along better if you stop criticizing everything I do.
Justification	Excuse of own behavior	I had a lot of work yesterday.
	Denying own responsibility	I never said I would take the garbage out.
Disagreement	Direct disagreement	No, it's not true.
	Yes-but	Yes, I could go back to school part-time, but it would take a long time to graduate.
	Short disagreement	No, what?
	Blocking off	That's enough, I don't want to talk more about the subject.

Table 5. ICS neutral verbal category examples

Category	Sub-category	Examples
Problem Description	Neutral description of the problem	I think we have a problem with our children?
	Neutral Questions	Did the car break down yesterday?
Meta Communication	Clarifying requests	Can you say it again, please?
	Related to topic	We're moving away from the topic.
Listening	Listening	
	Conversation pauses	10 seconds.
Rest Category	Rest category	

Table 6. ICS non-verbal category examples

Nonverbal Channel	Cue	
	Positive	*Negative*
Face	Smile, empathetic Frown, sneer, fearful, expression, head nod.	Frown, sneer, fearful, glare, angry expression.
Voice	Caring, satisfied, warm, soft, happy.	Cold, blaming, sarcastic, tense, accusing, depressed.
Body	Touching, attention, forward lean.	Rude gestures, pointing, inattention, arms akimbo.

Coding Process: When observing couple interaction, it is important that couples agree on a common problem area. While the couples are discussing the agreed subject, the conversation between them is recorded in a video and encodings are made while watching the video recording. During the coding process, the verbal and nonverbal behavior categories stated above are used. Encoding takes place

manually on a coding list. In order to provide practicality, only abbreviations and signs are used during coding. During this coding, the following points are taken into account (Hahlweg & Conrad, 1983):

1. The minute and second of each code should be noted during the video recording analysis involving pair interaction. This noting process facilitates coding and can be used later for reliability testing.

2. Video recording should include the whole interaction. Thus, observers can see the total picture of the interaction between the couples and discover where the couples' problem lies.

3. During coding, each reaction of men and women is coded separately and sequentially.

4. Encoded units can include a word such as "yes", a sentence such as "pleased" or a longer statement where the content is fixed. Some sentences can contain more than one code and can be divided into parts. For example;

- *You haven't been interested in your son for weeks* (specific criticism); *but he doesn't care as usual* (devaluation of the partner).

5. The coding of non-verbal categories as positive, negative or neutral is determined by calculating the total score of the behavior in each category (face, voice, and body). Each category is marked with symbols on the codes as follows: EL +, KA0. During the coding of non-verbal behaviors in ICS, the following sequence is followed: First, the "facial" cues of the speaker or listener are evaluated as positive, negative or neutral. If the coder cannot encode the expression as positive, negative or neutral, it scans for "tone of voice" cues. If the coder still cannot encode the expression in question as positive, negative or neutral, this time it scans the "body" cues.

6. Coding of consecutive reactions: For example, the speaker can criticize his partner first, then open himself up, and finally make a reaction that devaluates him. For example:

- *When you enter the house in the evening, you don't pay any attention to me* (specific criticism); *it bothers and upsets me* (self-disclosure); *this shows how careless and selfish you are* (devaluation of the partner).

In such cases, each response is encoded separately, and the response of the other partner after each encoding is also stated in the encoding list. When the other partner listens quietly to the speaking partner, this response is coded as "listening". Also, non-verbal responses are included in the list.

7. If one of the partners speaks for a long time in the same code group and the other partner gives more than one "short affirmation or rejection response" during this time, these responses are coded only once.

8. Each pore has a code during coding. It is not appropriate to have more than one code.

false:

man	CRS-* CRD-*								
woman									

* Specific (CRS)

** Devaluation of partner (CRD)

true:

man	CRS-*		CRD-**						
woman		LIS***							

* Specific (CRS)
** Devaluation of partner (CRD)
*** Listening (LIS)

9. While coding, either content-priority or time-priority coding can be done.

10. The Interactional Coding System allows the observation of a couple relationship as well as the interaction of more than two family members (For example, mother, father, child).

Coding Example: Below is the first four minutes of a dialogue about a couple discussing the feeding of their child:

Woman (00.21): *Let's talk about the nutrition of our daughter first.* (Meta-communication: / MCC)

Male (00.26): *B… 's birth weight was good, he was above his peers, his height was also, but now his weight has started to decrease.* (Problem description / PDD)

Woman (01.35): *Yes.* (Short agreement / AGS)

Male (01.36): *We must be careful about his diet. We do not have a problem with buying quality food, but sometimes we get bad food* (Problem description / PDD)

Woman (02.10): *So B… because she doesn't eat, I naturally tend towards ready-made food outside. If he eats a little more, the child will be more peaceful, calmer, and happy. I buy ready-made foods, I prefer. The child also wants this. He does not eat the food I prepare at home, but eats the ready-made food immediately without saying there is no* (Excuse of own behavior / JUB)

Male (02.42): *There are children who want but never eat sugar, do not know the taste of sugar, and have never been given sugar by their family. What the child wants depends on what you give. I think you are eating badly. It is fed with poor quality foods. Ready food consumes a lot B…. After that, he eats sugary foods a lot. We said we will not drink cola. We haven't taken it home for a long time, but you still let him drink coke outside sometimes.* (Specific criticize/ CRS)

Woman (03.58): *B… I feel at peace when I eat. I feel happy when something in love gets in his stomach. But when he doesn't eat, I get sad when he is not fed. I don't know how I will find a solution to this. I am in a vicious circle* (Self-disclosure: Expressing feelings / SDF)

Sample coding for the four-minute dialogue is given below. The order and time of the male and female behaviors were noted. During coding, abbreviations are used for verbal and non-verbal behaviors.

Man		PDD-		PDD-		CRS-	
Time	00.21	00.26	01.35	1.36	02.10	02.42	03.58
Woman	MCC0		AGS-		JUB0		SDF-
Face	+	-	-	-	+	-	-
Voice	-	-	-	-	-	- -	-
Body	-	-	-	-	-	-	-

Coder Education: In order to use the Interactional Coding System, it is important to undergo training given by researchers or to receive supervision support in this regard (Hahlweg & Conrad, 1983).

Studies Using the Interactional Coding System (ICS): Some of the studies using the Interactional Coding System have been conducted with individuals with various disorders and their families. In addition, there are experimental studies conducted with individuals who have marital problems and receive therapy support in the literature. The studies below are listed according to their subject areas:

1- Schizophrenia: In a study conducted by Hahlweg et al. (1989) with 43 families with schizophrenia, the participants were first recruited to the Camberwell family interview -CFI (Vaughn & Leff, 1976). CFI is a semi-structured individual interview with close relatives of the patient. It examines the level of influence of the relatives of the patients who are interviewed with the CFI technique from the difficulties that occur with the disease. After the CFI application, the Emotional Expression Scale (Duman, Kuşçu & Özgün, 2013) is given to the relatives of the patients. Accordingly, the relatives of the patients are divided into two as high and low emotional expressions. The expression of high emotion expresses the critical comments, extreme indulgence, and hostile attitudes of the relatives of the patients. In the study, the data obtained by CFI constituted the independent variable. The dependent variable of the study is family interaction and this interaction was observed with ICS. At the end of the study, it was observed that the group using high emotional expressions displayed more negative behaviors (EMS) than the group using low emotional expressions.

2- Depression: Another study similar to the study conducted with the relatives of schizophrenic patients was conducted with depressed patients and their spouses. A total of 30 patients and their spouses were studied. Using the Camberwell family interview scoring system, standard interviews lasting approximately 1.5-2 hours were conducted with the participants. After these interviews, spouses were classified as those with low and high expressions of emotion. Then, depressive patients and their partners were observed during a 10-minute face-to-face interaction using ICS. During this interaction, the couples argued about a conflict in their marriage. At the end of the research, it was seen that; Couples with high emotional expressions show less positive behaviors, both verbal and non-verbal, compared to couples with low emotional expression (Hooley, 1986).

3- Anxiety: Another study is about patients with anxiety disorders and their relatives. In this study, in which the structural equation model was used, the relationship between transactional stress and coping model with emotional expressions was examined. The variables included in the model; illness, personality traits, problem-solving skills observed with KPI, Symptom Checklist (SCL-90-R), Social Adaptation Scale and Camberwell Family Interview scoring system. 60 of the participants included in the study were diagnosed with obsessive-compulsive disorder and 41 with panic disorder. Within the scope of the study, an OCD and panic disorder treatment plan was applied to the participants. The treatment program consists of a total of 12 sessions of 90 minutes, twice a week. Afterward, follow-up studies, consisting of 4 sessions of 60 minutes, continued. At the end of the study, it was understood that the emotional arousal and hostility level of the relatives of the patients negatively affected the treatment received by the patients. As the level of hostility emerging as a result of the Camberwell family interview increases, the level of social adaptation decreases. In addition, the level of criticism obtained through the Camberwell family interview increases the social avoidance situation. Finally, participants who express high emotion use more negative behaviors expressed in ICS (Chambless, Bryan, Aiken, Steketee & Hooley, 2001).

4- Schizophrenia and depression: Schröder, Hahlweg, Fiedler, and Mundt (1996) compared the marital communication of depressive and schizophrenic patients and their spouses in their research, in which they examined whether the interaction patterns were specific to a specific disorder. Participants diagnosed

with 28 depression and 29 schizophrenia and their spouses were included in the study. The results showed that patients diagnosed with depression and their spouses exhibited less negative behavior compared to patients diagnosed with schizophrenia. "Criticism" has been rarely made, especially among depressed patients and their partners. These results show that depression increases interpersonal sensitivity, and this is a call for a different approach to diagnosed individuals and specialists performing marital therapy.

5- Agoraphobia: Another study was conducted with women with agoraphobia and their spouses. In the study conducted with 22 couples and 21 control groups, the marital interactions of the couples were investigated using ICS. The research hypothesis is that the spouses of the agoraphobic women will exhibit less problem-solving behavior than the control group. However, contrary to the hypothesis created at the end of the research, the spouses in the control group behaved less supportive than the partners in the experimental group. Consistent with the determined hypothesis, problem-solving behaviors of the spouses in the experimental group were found to be higher than the control group (Chambless et al., 2002).

6- Asthma: Hermanns, Florin, Dietrich, Rieger, and Hahlweg (1989) examined the relationship between the critical attitudes of mothers with asthmatic children and mother-child interaction. The study included a family of 25 asthmatic children and a control group of 25 people with similar characteristics. The children and their mothers discussed a problem that was determined in pairs, and this discussion was analyzed by ICS. In addition, a Camberwell family interview was held with each family. At the end of the study, it was found that mothers with asthmatic children had more "criticism" than mothers in the control group, and also used negative verbal behavior more frequently.

7- Atopic dermatitis: Wenninger, Ehlers, and Gieler (1991) examined the relationship between atopic dermatitis and problem-solving interaction. The hypothesis formed is that there is a relationship between the exacerbation of atopic dermatitis and stressful social interaction. For this purpose, 20 patients and their families were studied. After the bilateral discussions of the families, they found that the families in the experimental group used negative verbal and nonverbal behaviors more often than the control group. In addition, negative behaviors of the experimental group increased faster than the control group in follow-up studies.

8- Problem-solving interaction: The aim of the research conducted by Hahlweg, Kaiser, Christian, Fehm-Wolsdorf and Groth (2000) is to examine the relationship between communication patterns and problem-solving interaction. 81 married couples were included in the study. Participants reported problems in their marital life. They were asked to complete a 35-item Communication Patterns Scale (Heavey, Larson, Zumtobel & Christensen, 1996). The scale has subscales such as constructive communication, demand and withdrawal, avoidance, and coexistence. Then, the couples discussed a problem related to their marriage for 15 minutes, and this discussion was recorded. The recorded record was observed with ICS. According to the data obtained by Pearson moment product correlation, a positive and significant relationship was found between the couples' level of constructive communication use and verbal and nonverbal positive behaviors (.51). At the same time, other sub-dimensions of the Communication Patterns Scale gave significant relationships in the same direction with the positive behaviors observed with the EXT.

9- Behavioral marriage therapy: In a study examining the effect of behavioral marriage therapy on couples' communication skills, 29 married couples were studied. These couples stated that they had a problematic relationship. A control group of 14 couples was also included in the study. No therapeutic help was

provided to the control group. Four of the 18 standard conflict situations included in the pre-therapy marital conflict inventory were asked to find solutions and discuss among themselves. Meanwhile, the discussion between them was recorded. Then, the couples were taken to 15-session couple therapy. The initial procedure was repeated after the last session. As a result of the analysis, significant differences were found between the experimental and control groups in terms of both positive and negative behaviors; however, no significant difference was found in terms of neutral variables. At the end of the study, it was observed that behavioral marriage therapy was quite effective on non-verbal behaviors. For non-verbal behaviors, the number of negative behaviors decreased and the number of positive behaviors doubled. There was no significant increase in verbal behavior (Hahlweg, Revenstrof & Schindler, 1984).

10- Cognitive behavioral couple therapy: 67 couples were included in the study in which the effect of cognitive-behavioral therapy program on couples' problem-solving interactions was investigated. Communication and problem-solving training was provided within the scope of the therapy program, discussions were made to clarify the expectations of the couples in the relationship, and exercises were carried out to improve their emotional and sexual relations. After the evaluations, it was observed that the intervention group preferred positive verbal and nonverbal behaviors more during discussions than the control group. In addition, in the one-year follow-up study, the intervention group reported fewer problems than the pre-evaluation results (Kaiser, Hahlweg, Fehm-Wolfsdorf & Groth, 1999).

11- Pre-marital period: In a longitudinal study conducted by Hahlweg, Markman, Thurmaier, Engl, and Eckert (1998), the pre-marital problems of German couples were taken under a long-term examination. Within the scope of the research, Couple Learning Program (EPL, A Couple's Learning Program) was developed to teach couples effective communication and problem-solving skills. EPL is the revised version of the Prevention and Relationship Enhancement Program (PREP) developed by Markman and Denver University, in line with the needs of German couples. 72 couples were included in the study. 14 of them were in the control group. Participants were taken to a six-session intervention program after pre-evaluation. In a follow-up study that lasted for three years, reinforcement studies were made occasionally. Post-intervention evaluations took approximately two and a half hours. In these evaluation studies, a set of measurement tools (relationship stability, relationship satisfaction scales, and problem list) were given to the couples. At the same time, each couple discussed the three most problematic issues in their relationship for 10 minutes. At the end of the study, it was found that the intervention group got higher scores than the control group in terms of relationship stability, relationship satisfaction and positive behaviors.

Adaptation of Interactional Coding System to Turkish

1- Translation process: The Problem Areas List in the Interactional Coding System in the adaptation process has been translated into Turkish by the researcher. Later, two academics from the field who have command of both languages compared the Turkish forms and gave their feedback. The form was finalized, taking into account their feedback. The ICS category booklet/coding booklet was translated into Turkish by the researcher. Later, a translation agency translated the measuring tool into Turkish again. Then, the measurement tool was given its final form by comparing the two translations with a researcher working in the field and mastering the subject.

2- Sample selection: 31 couples who stated that there was a problem in their marriage during the data collection process and marked at least one problem area in the Problem List volunteered to participate

in the study. 3 of these couples could not be included in the study because they gave up video recording during the application. Another 3 couples were not included in the study as they could not fulfill the video recording procedure. As a result, 25 married couples who volunteered to participate in the adaptation process were studied.

3- Application: After determining the married couples who volunteered to participate in the study, a foresight was made with them. These interviews were conducted in the university psychological counseling unit. These couples stated that they had problems in at least one area in their marriage and that they had difficulties in overcoming these problems. In the interview, it was stated that the couples would fill in a series of scales during the application and then discuss a topic they thought was a problem in their marriage. They were asked if this discussion would be videotaped and whether they would be uncomfortable with this recording. Common application date has been set with the couples approving the working procedure. Applications were also carried out in the psychological counseling unit. Before the application, the researcher had the couples' seating arrangements, the equipment to be recorded and the forms in the room. After a daily conversation with the couples, they were asked to fill out the Information Confirmation Form, Demographic Information Form, and Problem List, respectively. Then, through the Problem List, they were asked to identify a common problem area in which they thought they had a conflict in their marital life. After the problem topic was determined, the couple were told to find a solution to their common problems after expressing their feelings and thoughts about this issue for 20 minutes. It is explained that it is not important for them to find a solution to their problems. After the explanations were made, the researcher left the couple alone. The interaction of the couples looking for solutions to their problems was recorded on video. The researcher did not interfere with the communication between the couple themselves.

After the data collection phase was completed, the data analysis phase was started. The video recordings of the couple's interactions were encoded by watching them one by one. Coding was done on a scoring form by taking the behavioral categories of the Interactional Coding System as a reference. During the coding, when each behavior observed in the couples occurred was noted in an observation record list. For the sake of convenience, the abbreviation is used for the observed behavior. Verbal and nonverbal behaviors of the couples were observed simultaneously and encoded in the recording list. At the end of this coding process, a coding form belonging to each couple was created. On the form, which behaviors the male and female participants used during the interaction, how often and when they used them were included. Afterwards, the information in the coding form was transferred to the SPSS 22 program. In order to analyze the video recordings, deductive content-coding was made. The encodings were transformed into numerical data, so the frequency of the behavior observed in each pair was revealed.

4- Validity and reliability studies: The adaptation of the Interactional Coding System (ICS) to the culture and its use on married individuals within the scope of the research also constitutes the content validity of the study. During the ICS adaptation process, the scope validity was increased by consulting an expert. The researcher, whose opinion was consulted and who also developed the ICS, has conducted experimental and applied studies on family and couple communication for many years and has conducted many research and publications on observational coding systems. Supervision support was received from the researcher during the adaptation process. Sample coding made during the supervision support was presented to the researcher. For this purpose, it was studied with a couple communicating in English. The couple will spend 20 minutes in the problem area titled "relatives and relatives of the spouse".

discussed. Coding was done through this English recording. The coding was shown to the researcher along with the video recording. Necessary adjustments were made in the coding process regarding the supervision received. In the continuation of the study on supervision, another couple was asked to discuss a problem area they had in their marriage for 20 minutes. The couple discussed the issue of "feeding the child". The discussion was recorded on video. Afterward, the written transcript of the video recording of the couple was made. The transcript has been translated into English. The minute the reaction was given and the explanation of the coding were noted next to each behavioral category on the English transcript. The relevant video was presented to the researcher's opinion with the coding made and the feedback received was taken into consideration in the studies. In addition, communication with the researcher was maintained during all applications and his opinion was consulted in the process in order to prevent a possible malfunction.

Since ICS is not a standard measurement tool, its reliability was not considered. Instead, encoder reliability was applied to test the consistency of the encodings. For encoder reliability, video recordings obtained from three pairs (C1, C9, and C20) were studied. The video recordings of these three pairs are encoded by two encoders. One of its coders is the researcher himself. The researcher received training and supervision support in the field of family and couple therapy. The other coder is a PhD in the field or he has received training in family and couple therapy. Before proceeding with the coding, the researcher informed the other coder about the Interactional Coding System and a sample coding was done together. Later, the encodings made by both coders were analyzed to test validity. Kappa coefficient was used during the analysis. As a result, it was seen that the Kappa coefficient was .88 ($p < .001$) for verbal codes and .81 ($p < .001$) for non-verbal codes. This showed that the study is a very reliable study for coders.

DISCUSSION, CONCLUSION & SUGGESTIONS

Within the scope of the research, a comprehensive coding system (Hahlweg & Conrad, 1983) that provides the opportunity to observe, encode, and analyze couple interaction has been brought to the field. This system offers the opportunity to examine the problem-solving interactions of the couples in detail and to simultaneously encode the verbal and non-verbal behaviors that occur during the interaction. The order in which each behavior occurs in couples, how and how often, can be determined by this system, allowing researchers to categorize and analyze these behaviors (Hahlweg & Conrad, 1983; Hahlweg, 1996). Direct observation of this process in detail will make it easier to reveal the communication patterns used by couples, to detect errors in communication, and to rearrange the relationship of the couple. Because communication skill is a skill that is acquired and developed later. Therefore, this skill level should be determined first. Thanks to the Interactional Coding System, it can be observed what kind of positive or negative, verbal and non-verbal reactions couples give during their communication. The coding of these responses is practically a guide for the practitioners in the field of couple and family therapy to increase positive skills, and develop neutral and negative skills. Besides Interactional Coding System, yürtül the marriage relationship in Turkey, programs for the development of peer communications (Shields, 2002; Ersanli, 2007; Duran & Hamamcı, 2010; sour & Hero, 2012) can be used as an assessment tool to test its effectiveness.

In addition, some cultural-based behaviors were not found in the coding system developed by Hahlweg (2004). For example, while the woman's silence during the criticism of her husband is interpreted as an inability to express (negative behavior expressing tension) in Turkish culture, this reaction is coded as a

neutral behavior in western culture. For this reason, it is thought that it may be important to develop a new culture-based coding system that aims to observe couple interaction.

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Author Contributions

This study was conducted by both authors working together and cooperatively.

Conflict of Interest

The authors of the study declare that there is no conflict of interest.

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Ethical Statement

The study was investigated and permitted by Cukurova University Scientific Research and Publication Ethics Board. Additionally, data tools in the study were only distributed to volunteer participants. All participants provided informed consent.

Ethics Committee Name: Çukurova University Scientific Research and Publication Ethics Board in the Field of Social and Human Sciences
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