Uluslararası Anadolu Sosyal Bilimler Dergisi
Cilt: 7
Sayı: 3
Yıl: 2023

# SCHULTZ DUYGU İŞLEME TESTİ- İLK VERSİYON'UN (STEP-P) 3-5 YAŞ ÇOCUKLARI İÇİN GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI

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**ÖZET**

Bu araştırma 3-5 yaş çocukları için Schultz Duygu İşleme Testi- İlk Versiyon'un (STEP-P) geçerlik ve güvenirlik çalışması amacıyla yapılmıştır. Araştırma nicel araştırmalardan genel tarama modelinde tasarlanmıştır. Araştırmanın çalışma grubunu 2019-2020 eğitim öğretim yılında Konya İl Merkezinde Milli Eğitim Bakanlığına bağlı anaokullarına devam eden 3-5 yaş grubunda 310 çocuk olışturmaktadır. Araştırma verilerinin toplanması amacıyla Schultz Duygu İşleme Testi- İlk Versiyon (STEP-P) ve Genel Bilgi Formu kullanılmıştır. Testin geçerlik çalışmaları için kapsam geçerliği (uzman görüşü) ve yapı geçerliği (doğrulayıcı faktör analizi) incelenmiştir. Ölçümlerin iç tutarlılık anlamındaki güvenirliği için KR-20 güvenirlik katsayısı, bağımsız gözlemciler arası uyum ve test tekrar test güvenirliği için normallik varsayımı karşılandığında Pearson korelasyon, karşılanmadığında Spearman korelasyon katsayısı hesaplanmıştır. Yapılan analizlerde Schultz Duygu İşleme Testi- İlk Versiyon'un (STEP-P) 3-5 yaş çocukları için geçerrli ve güvenilir bir test olduğu saptanmıştır.

**Anahtar Sözcükler:** Duygu İşleme, Okul Öncesi, Sosyal Bilgi İşleme, Schultz Duygu İşleme Testi

# VALIDITY AND RELIABILITY STUDY OF SCHULTZ TEST OF EMOTION PROCESSING – PRELIMINARY VERSION (STEP-P) FOR 3-5-YEAR-OLD CHILDREN

**ABSTRACT**

This study was conducted for the validity and reliability study of the Schultz Test of Emotion Processing – Preliminary Version (STEP-P) for 3-5-year-old children. The study was designed in the general survey model, one of quantitative research. The study group consists of 310 children in the 3-5 age group attending kindergartens affiliated with the Ministry of National Education in Konya City Centre in the 2019-2020 academic year. Schultz Test of Emotion Processing – Preliminary Version (STEP-P) and General Information Form were used to collect the research data. Content validity (expert opinion) and construct validity (confirmative factor analysis) were examined for validity studies of the test. KR-20 reliability coefficient was calculated for the reliability of the measurements in terms of internal consistency. The Pearson correlation coefficient was calculated when the normality assumption was met, and the Spearman correlation coefficient was calculated when the normality assumption was not met for independent inter-observer agreement and test-retest reliability. The analyses showed that the Schultz Test of Emotion Processing – Preliminary Version (STEP-P) is a valid and reliable test for 3-5 year old children.

**Keywords:** Emotion Processing, Preschool, Social Information Processing, Schultz Test of Emotion Processing

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This study was prepared by making use of the doctoral thesis titled " The Effect Of Social Information Processing, Self-Regulation And Metacognition Variables On Theory Of Mind: Structural Equality Modeling" conducted by the first author under the supervision of the second author.

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Research Article Pp:784-800
Received Date: 04.07.2023 Accepted Date: 27.09.2023 Puplication Date: 30.09.2023

## INTRODUCTION

The social information processing model has been put forward as an explanation of how mental processes affect behavioral responses in social situations (Dodge & Rabiner, 2004). The social information processing model provides a comprehensive model for understanding the processes involved when a child makes sense of and acts in social situations. This model also recognizes that children enter social situations through a predetermined set of biological and environmental-based effects (Cooke, 2017, p.50).

Supporting children's social information processing models in the early period may affect their school readiness and academic success by contributing to their social behavior in school life. However, inadequacies in social information processing can result in children being disadvantaged in the classroom, since they may misinterpret the intentions of others, negative emotional processes may occur, and less competent social behavior may be observed. This may lead to the formation of negative attitudes and intentions towards children who are incompatible with others, making academic preparation difficult due to the negative social environment around them, and thus resulting in a self-fulfilling prophecy (Ziv, 2013, p.309).

It has been found that initial problems and prejudices in social information processing can lead to behaviors that cause children to be rejected by their peers early in primary school. Social rejection changes the way children process information during future peer interactions. Social rejection also changes the way children participate in social cues and solve social problems by increasing their hyper-vigilance towards hostile cues, their tendency to produce aggressive reactions to peer dilemmas, and their ability to stimulate these reactions. First, prejudices and deficiencies in information processing cause the child to be rejected by peer groups. A child who exhibits prejudices related to hostile attribution, who is unable to generate competent solutions to interpersonal dilemmas, and who is incapable of enacting competent behavioral responses is also at risk of social rejection. Secondly, social rejection by peers has a long-term effect in triggering the child's processing-related prejudices and deficiencies. As a result of rejection, the child is more likely to attribute hostile intentions to peers, produce aggressive responses inappropriately to social rejection dilemmas, and be incapable of enacting competent behavioral responses. Finally, prejudices and deficiencies related to this processing process, partly as a result of rejection by the peer group, later lead to chronic aggressive behavior problems (Dodge et al., 2003, p.7).

According to the results obtained from the studies on social information processing, social information processing is accepted as evidence of the efficient functioning of the organism. However, it is also accepted that deterioration in behavior may be related to excessive information processing. For example, a child may withdraw from social interaction because the information processing is constantly active and responds inadequately. As a result, inappropriate behaviors may be observed due to loss of attention. Another result is that social information processing steps are determined to occur in a temporal sequence, which means that one step affects the next step but cannot fully determine it. As a result of the study, it was also revealed that the problems occurring in information processing may be caused by the failure in the processing process, misinterpreting or guessing the clues incorrectly, and prejudice (Dodge, 1986).

Crick and Dodge (1994) redesigned the social information processing model. In its redesigned form, as in the previous model, children become social with a set of biologically limited abilities and memories obtained from experiences. This redesigned model includes encoding of external and internal cues, mental representation of these cues and interpretation, clarification or selection of a target, reaching or generating a response, response decision, and finally behavioral regulation. It is assumed that during the coding and interpretation of social cues in steps 1 and 2, children selectively attend to certain situational and internal cues and then interpret them. These interpretations include a filtered personalized mental representation of situational cues stored in the long-term memory, a causal analysis of the event that has occurred, inferences about the perspectives of others, an assessment of whether a previous social change has achieved the goal, an evaluation of the accuracy of recent

expectations and self-efficacy predictions made during a previous exchange with peers, and inferences about the meaning of previous and current change for self and others. All of these interpretation processes can be influenced or directed by the information stored in memory or cause changes in the information later on. In step 3, after the situation is interpreted, children are suggested to choose a goal or desired outcome for the situation (making friends, obtaining the desired toy, avoiding uneasiness, etc.) or continue with a pre-existing goal. Goals are states of focused arousal that serve as dispositions to produce or want to produce certain outcomes. In step 4, it is assumed that children access possible responses to the situation through memory or, if it is a new situation, they can create new behaviors in response to instantaneous social cues. In Step 5, it is assumed that children evaluate previously accessed or structured responses and choose the most positively rated response for the role-play. It is recommended that several factors be included in the process of evaluating responses, such as the results that children expect to achieve after using each response (outcome expectation), the degree of confidence in their ability to enact each response (self-efficacy), and the evaluation of the relevance of each response (response evaluation). The response chosen in step 6 is behaviorally enacted. The Redesigned Social Information Processing Model is summarized in Figure 1.

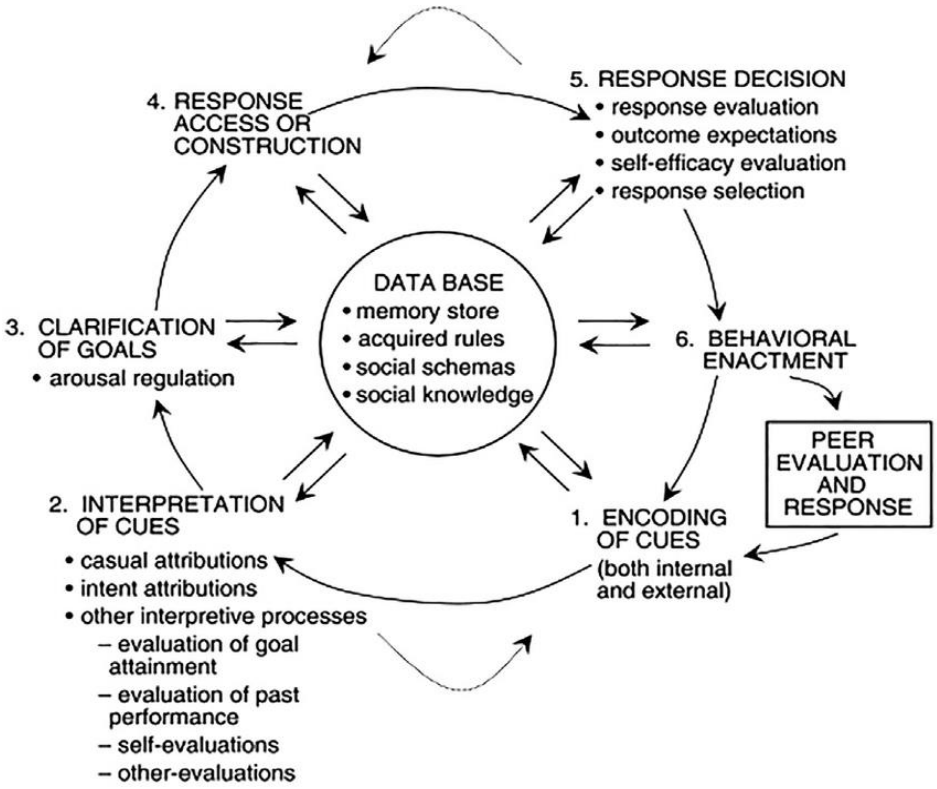


**Figure 1. Redesigned Social Information Processing Model**

**Source:** Crick and Dodge, 1994.

Although the social information processing model has been described in several studies, it gains a more concrete framework with a simple example. For instance, a child hit by a ball while walking on the playground should find out what happened in step 1, attention and coding, and why it happened (accidentally, intentionally) in step 2. In step 3, which is the explanation of the goals, the child's own goals (being friends, etc.) are decided. In steps 4 and 5, the child generates possible reactions to the situation and evaluates them in terms of expected outcomes and self-efficacy in enacting the behavior, etc., and finally, the selected response is behaviourally enacted in step 6 (Arsenio, 2010, p.628).

According to the social information processing model, the child is unable to identify characteristic patterns in responding due to too much information available in the social environment. These patterns may be based on

unconscious influences (mood, self-esteem, goals, etc.). They may also emerge as socially competent, incomplete processing, and prejudices (Dodge, 1985, p.87).

The redesigned social information processing model is an important element in the theoretical field of the development of aggressive behavior. The social information processing model suggests that certain elements only indirectly contribute to aggressive behavior through relationships with other elements in the model. For example, the explanatory value of response generation lies not only in a direct relationship with aggressive behavior but also in the relationship with response selection, i.e. with aggressive behavior. Therefore, there are also indirect structural relationships suggested by the integration of emotion processes in the social information processing model (Orobio de Castro et al., 2005, p.105).

Studies examining the relationship between self-schema and social information processing show that the self affects the perception of the person, self-image is related to the processing of social events, and small situational changes in self-perceptions can cause changes in the way social information about others is processed (Lewicki, 1984).

**1.1.Emotion Processing**

Emotion recognition skills include awareness of emotion being expressed, labeling prototypical expressions and non-prototypical expressions, and using contextually relevant clues in identifying and labeling emotions (Castro et al., 2015). Expression recognition includes the ability to identify the emotional expressions of others. Situational understanding is a more complex skill that involves the ability to interpret emotions in social contexts and to recognize that the same situations can lead to different emotional responses among individuals. For example, a child with a high level of situational understanding may feel anxious when it is his/her turn to show and explain, but s/he will understand that other children may feel happy and excited when it is their turn (Howarth, 2014, p.8). Emotion knowledge skills consist of 5 skills: internal and external causes of emotions, characteristics of emotions including the structure, timing, and sequence of emotions, consequences, and functions of emotions, cultural rules and norms, and the most appropriate strategies available for a particular situation in the management of emotions (Castro et al. ., 2015).

Aggressive individuals have a strong tendency to attribute hostile intent to the behavior of others, which can lead to provocation and exacerbation of socially inappropriate responses. Individuals prone to aggression may pay attention to certain non-verbal cues or inequalities between verbal and nonverbal information (such as a sarcastic tone of voice or a worried facial expression) during social interactions (Schönenberg & Jusyte, 2014).

Emotions are multidimensional structures that include physiological experiential components (e.g., heart rate), cognitive components (e.g., interpretation of situations, recognition of facial cues), behavioral/expressive components (e.g., facial expressions), attitudinal components (e.g., values placed on emotional experiences), and regulatory components (e.g., coping or defense mechanisms to minimize, exaggerate or distort emotions). Each of these components (or the interaction between different components) may have unique developmental aetiologies and/or epigenetic timelines. The complexity of this emotional functioning makes it difficult to make generalizations about the nature of emotional development as a single structure (Brody, 1985, p.104).

Emotional information can be obtained through several different fields, including semantic information, prosody, non-verbal visual cues, body postures, and facial expressions. Studies generally focus on the identification of facial expressions due to the difficulties in examining the development of emotional information (Herba & Phillips, 2004, p.1186).

The literature on the contribution of social cognitive and emotional processes to children's social competence is reviewed and interpreted in the context of an integrated model of emotion processes and cognition in social information processing (Lemerise & Arsenio, 2000,p.112-115). Dodge (1991) states that the whole process of information processing is emotional, this emotion has the energy that directs, organizes, strengthens, and weakens cognitive activity, and there is no non-emotional action. He also accepts emotion as a complement

to experience and information processing. Although emotion is seen as an integral part of information processing, it is more often referred to as the emotional aspect of information processing, such as emotions experienced in response to the perception of events or the effects of emotions on attention. For this reason, emotions are often conceptualized separately from cognition. Four different aspects of emotion are related to information processing in different ways. Although the physiological system is different from the information processing system, it has a reciprocal effect on it. The goal-directed and energizing aspect of emotion drives attentional processes. The experiential aspect of emotion changes the interpretation processes. Expressive behavioral aspects of emotion are seen as the actualized behavioral outcomes of information processing steps. Therefore, the concept of emotion is integrated with information processing theories (Dodge, 1991).

The social information processing approach for aggressive behavior contributes significantly to understanding the development of aggressive behavior. As children mature in their cognitive abilities and engage in more complex social interactions, they acquire reflective social information processing skills that allow them to inhibit emotional social information processing and follow the reflective path, taking into account both the intentions and feelings of others and the possible outcomes of multiple events. In this process, they begin to appreciate the social norm that the extent to which aggressive responses are appropriate depends on the intentions and emotions of others. What develops in this process is not a tendency to attribute hostile intentions, but the ability to detect benevolent intentions and modify one's response accordingly. Similarly, alternative responses to aggression are tried and reinforced. These reflective social information processing skills do not replace the emotional pathway, but adjust it under conditions that society deems inappropriate (De Castro, 2004).

Emotion processing was integrated into Crick and Dodge's model, and the integration of emotion and social information processing increased the explanatory power of the model. In the social information processing model of Crick and Dodge (1994), the source of information about children's knowledge includes acquired rules, social knowledge, and social schemas. In the new model, effect-event connections were added to the knowledge base, since children's social knowledge can be supported by events and emotional clues, and events can also point to emotions. "Emotional cues of others, emotion recognition and empathic response " were added to the Coding Clues stage, which is the first stage of the social information processing model, since the emotional cues of the peers can also affect the children's goals. The "emotional nature of the relationship with peers" was added to the 2nd stage, Interpretation of Clues, since the nature of emotional bonds with an interaction partner can also affect coding and interpretation. The "emotional nature of the relationship with peers" was added to the 3rd stage, Clarification of Goals, since the nature of emotional bonds between children and others can influence goal selection. In steps 4 (Reaching or Creating a Response) and 5 (Response Decision) of the model, children access possible responses to the situation and evaluate them in terms of possible outcomes, goals, and self-efficacy to realize the response. The response that is evaluated most positively in terms of the child's goals is selected. In addition, it is emphasized that children's access to responses can be affected by an emotion they experience and that reaching certain responses can also change an emotion. Both possibilities support the idea that representations of past experiences have an emotional component, and emotions such as feeling angry, scared, or happy may indicate different types of responses. For this reason, "physical markers giving emotional priority" were added between the 4th and 5th stages. The intensity with which emotions are experienced and the capacity to regulate emotion were taken into account as other emotion processes that may affect access to and evaluation of responses, and "emotional expectations, regulation of emotions, the emotional nature of relationships with peers, and empathic response" were added to stage 5. In Stage 6, Behavioral enactment, the child enacts the chosen response. In this enactment process, emotion-related processes, the intensity with which emotions are experienced, and the child's regulatory capacities can affect behavioral enactment. The ability to flexibly display emotions appropriate to the situation requires the person to have control over the power of expression and to be sensitive to the situation from multiple perspectives. For this reason, "rules for producing and showing emotion" were added to stage 6.

Emotional cues can also inform the child about the ultimate success or failure of his/her behavioral enactment. For example, in a situation where a child wants to play with a peer's toy, an emotionally positive offer to exchange toys may be successful in that the child not only gets the toy s/he wants but that both children feel positive and can even play together. However, an angry request from the peer to hand over the toy can also lead to anger and resistance, resulting in the child having neither the toy nor the playmate. The emotional cues that are part of the child's enactment influence the reaction of the peers and ultimately the outcome of the confrontation, including related emotions. Therefore, "Peer Evaluation and Reaction" was also added to the last stage. This new model is schematized in Figure 2 (Lemerise and Arsenio, 2000, p.112-115).

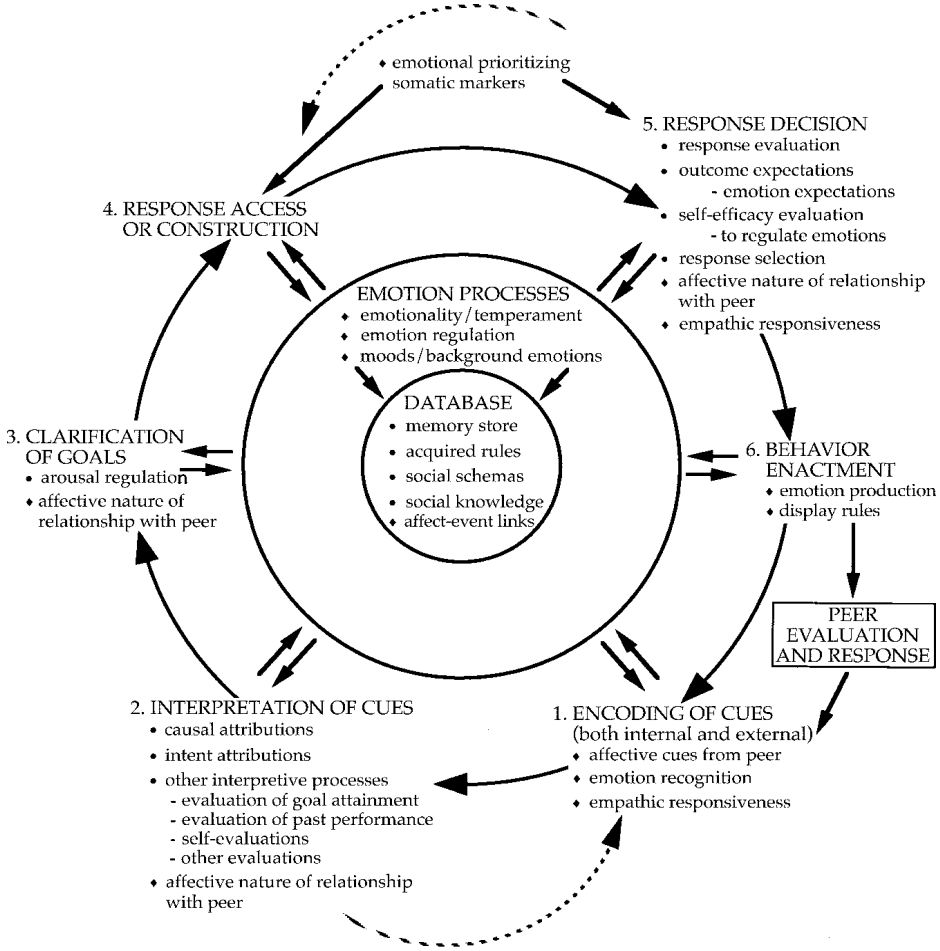


**Figure 2. Emotion Processing Process Integrated into Social Information Processing Model**
**Source:** Lemerise and Arsenio, 2000.

Preschool children are in a period when the complexity of the social world is just beginning to be understood. There is a strong correlation between the quality of the parent-child relationship in this period and the child's social information processing behavior. In particular, a social information processing approach is needed to understand the behavior of the mother with her child and how the child behaves in the social environment (Ziv, Kupermintz, & Aviezer, 2016,p.31-32). Individual differences in the social information processing model are also associated with children's cognitive structures and family income. In unpleasant social mishaps in the preschool years, the individual's attribution of more or less hostile intentions to others is associated with problem behaviors. As children reach more complex understandings of the link between beliefs, intentions, and actions during the early school years, they may become more sensitive to the particular content of attitudes expressed by the primary caregiver. The process of social information processing can be negatively affected especially in authoritarian attitudes. The power of maternal education to influence authoritarian attitudes proves

the effect of maternal education and attitude variables in social information processing (Runions & Keating, 2007, p.839-847).

Aggression in children is associated with a tendency to attribute hostile intentions to others. Hostile attributions of the mother are also associated with negative parenting behavior, which in turn affects the child's adjustment. Hostile attributions of the mother are associated with psychosocial difficulties (Healy et al., 2015). It is assumed that children's anger attribution bias partially mediates the relationships between children's family environment and social adjustment and that caregiver depression and family instability may also affect children's anger attribution bias. In addition, compared to children from middle-class families, economically disadvantaged children are thought to be more likely to perceive others as "angry" in the school environment (Schultz, Izard, & Ackerman, 2000).

In the social information processing model, temperament is effective in socialization experiences (parenting quality, attachment, and peer relationships), interactions, emotional qualities, and the emergence of social information processing steps and the connections between these steps (Davies et al., 2020). Social information processing patterns can continue to contribute to children's social behavior at school, and thus affect their readiness for school and their academic success. However, social information processing disorders can cause children to be in a significant disadvantageous position in the classroom, because, in the presence of social information processing disorders, the person may misinterpret the intentions of others, allocate important resources to negative emotional processes, and turn these emotions into less competent social behaviors (Ziv, 2013).

The strength of the social information processing model stems from its ability to explain how early life experiences have a lasting impact on children's later aggressive behavior, and two main claims are put forward. First, it is hypothesized that negative early life experiences lead children to process social information in biased ways, such as being hypervigilant to hostile cues and evaluating aggressive behavior as an acceptable and successful way of self-defense. Second, it is assumed that the impact of these negative life experiences on children's aggressive behavior is directly explained by the extent to which these experiences lead children to develop biased processing patterns (Dodge, 2003). There is also a view that aggressive behaviors of the explicit and relational types are passed from mother to daughter through the modeling of hostile attribution biases. It is also important to educate parents to break this intergenerational transmission chain (MacBrayer, Milich, & Hundley, 2003).

The quality of peer interactions in young children naturally increases over time. However, this is also influenced by the quality of parent-child relationships in the toddler years and the way children think about social interactions in preschool (Raikes et al., 2013, p.79). Similarly, it is another accepted view that fathers' goals and strategies are significantly related to children's use of similar goals and strategies. For example, fathers' relational-prosocial goals are related to children's relational-prosocial goals. Social representations of parents, especially fathers, have an important role in children's social information processing processes (McDowell, Parke, & Spitzer, 2002, p.482).

Due to the important role of social information processing and emotion processing in children's developmental process, this study aimed to conduct a validity and reliability study of the Schultz Emotion Processing Test - Preliminary Version (STEP-P) for children aged 3-5 years.

## 4. METHOD

### 2.1.Study group

The study group consists of a total of 310 children aged 3-5, attending the preschools and kindergartens affiliated to the Ministry of National Education in the city center of Konya, and their mothers. The sample size is estimated based on relative criteria such as the number of items or factors. For factor analysis, the sample size is reported to be 100=poor, 200=adequate, 300=good, 500=very good, and 1000 and above= excellent. The sample

size recommendation of Bryman and Cramer is to apply as much as the number obtained by multiplying the number of items by 5 or 10 (Cokluk et al. 2018). Therefore, in this study, the sample was determined as 310 people, based on 5 times the number of items.

**2.2.Data Collection Tools**

In the study, the Validity and Reliability Study of the Schultz Test of Emotion Processing – Preliminary Version (STEP-P) for 3-5-year-old Turkish children was conducted.

**2.2.1.Schultz Test of Emotion Processing – Preliminary Version (STEP-P)**

It is a video-based test developed by Schultz et al. (2010) to examine the social information processing processes of 3-5-year-old children. STEP-P consists of 3 subtests: Emotions, Goal Acquisition, and Provocation. The test consists of a total of 62 items and 62 short videos (5 to 15 seconds), including 24 items in the Emotions subtest, 20 items in the Goal Acquisition subtest, and 18 items in the Provocation subtest. Before each video, a voiceover provides the context of the video to ensure that children understand and encode the critical features of each video. After each video, the video is summarized with a voiceover. Depending on the type of video, the practitioner asks questions to the child. In the Emotions subtest, the child is asked to say which of the emotions "sad, angry, scared, happy" the child might have felt in the video that includes specific and ambiguous emotions. In the Goal Acquisition subtest, the child is asked to make behavioral predictions about the skits in the video. In the Provocation subtest, the child is asked to make predictions about the reason for the behaviors in the skits in the video and how the behaviors might make the person feel. Emotion Recognition and Anger Attribution Dimension scores are obtained in the Emotions subtest. The emotion Recognition score is created by giving 1 for each emotion answered correctly and 0 for incorrect answers. The Anger Attribution Dimension score is created by giving 1 point for each angry answer. In the Goal Acquisition subtest, 10 of the videos are about co-operative and 10 are about aggressive efforts to reach the goal. In this section, Positive Evaluation of Cooperation, Positive Evaluation of Aggression, and Moral Acceptability of Aggression scores are created. In the Provocation subtest, there are 5 different questions in each item group and separate scores are created for them (Schultz et al., 2010).

**2.3.Data Collection**

In the study, data were collected by interviewing the children and their mothers face-to-face and individually using data collection tools.

**2.4.Analysis of Data**

A translation and back-translation procedure was applied to translate the test from English to Turkish and language equivalence was ensured. Rstudio (2022.07.1) interface of R programming language was used for validity and reliability evidence of the Schultz Test of Emotion Processing – Preliminary Version (STEP-P). In the analyses performed with the "lavaan" package (Rosseel, 2012), WLSMV (weighted least square means and variances) was preferred as the estimation method since the data were sequential. Content validity (expert opinion) and construct validity (confirmative factor analysis) were examined for validity studies of the test. For content validity, the test was sent to 5 academicians, 1 with a doctorate in guidance and psychological counseling and 4 with a doctorate in child development and education, and expert opinions were obtained in terms of the suitability of the items to the relevant age group and development area and the appropriateness of the way the items were presented.

## 5. RESULTS

For the expert evaluations of the Schultz Test of Emotion Processing – Preliminary Version (STEP-P), whose validity-reliability analyses were conducted for 3-5 year old children, expert opinions were obtained from 5 academicians. All experts reported that the items in the scale are necessary and appropriate. Therefore, all items in the original form were used in the data collection process.

Confirmatory Factor Analysis was conducted with the data obtained from each scale for the construct validity of the Schultz Test of Emotion Processing – Preliminary Version (STEP-P). In the CFA analysis, the

limit values (Schumacker & Lomax, 2004; Hu & Bentler, 1999; Thompson, 2004; Kline 2015) were evaluated according to Table 1.

**Table 1. Limit Values in CFA Analysis**

| Indices | Limit Values |
|---|---|
| $\chi^2/_{sd}$ | Excellent ≤ 3≤ Good ≤ 5 |
| **RMSEA** | Excellent ≤ 0.05 ≤ Good ≤ 0,08 |
| **SRMR** | Excellent ≤ 0.05 ≤ Good ≤ 0,08 |
| **CFI** | Excellent ≥ 0.95 ≥ Good ≥ 0,90 |
| **NNFI** | Excellent ≥ 0.95 ≥ Good ≥ 0,90 |
| **GFI** | Excellent ≥ 0.95 ≥ Good ≥ 0,90 |
| **AGFI** | Excellent ≥ 0.95 ≥ Good ≥ 0,90 |

The KR-20 reliability coefficient was calculated for the reliability of the Schultz Test of Emotion Processing – Preliminary Version (STEP-P) in terms of internal consistency. For the independent inter-observer agreement and test-retest reliability, the Pearson correlation coefficient was calculated when the normality assumption was met and the Spearman correlation coefficient was calculated when the normality assumption was not met.

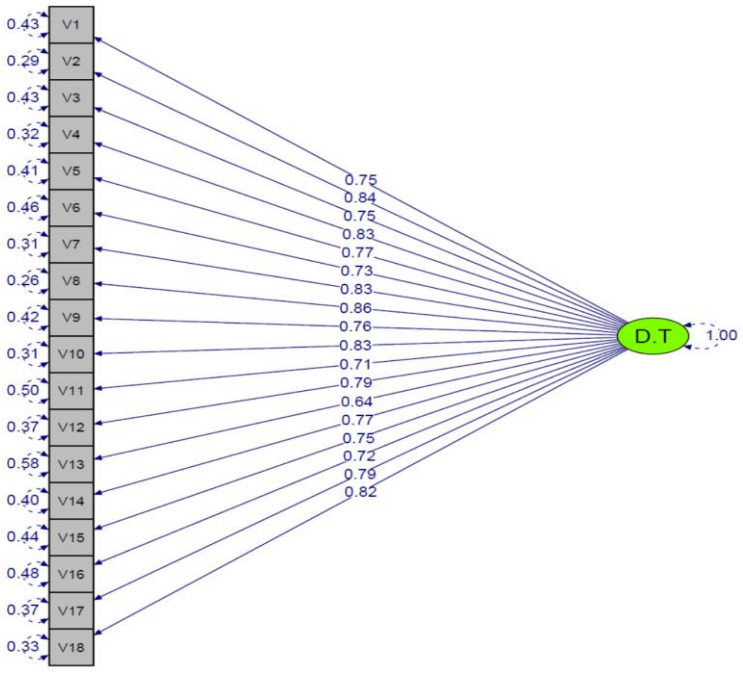


**Figure 3. CFA Results for STEP-P Emotion Recognition Dimension of the Emotions Subtest (Standard Coefficients)**

Figure 3 shows the CFA results for the Emotion Recognition Dimension of the Emotions Subtest. In the CFA results for the evidence of construct validity with 18 items in the scale, χ^2⁄sd=1.26; RMSEA = 0.03; SRMR = 0.10; CFI = 0.99; TLI = 0.99. When Figure 3 is examined, it is seen that the factor loads are between 0.64 and 0.86. The KR-20 reliability coefficient calculated for the reliability of the measurements obtained with 18 items and 310 people using the scale is 0.89. The test-retest reliability is 0.80. Therefore, it can be said that the measurements are quite reliable in terms of internal consistency.

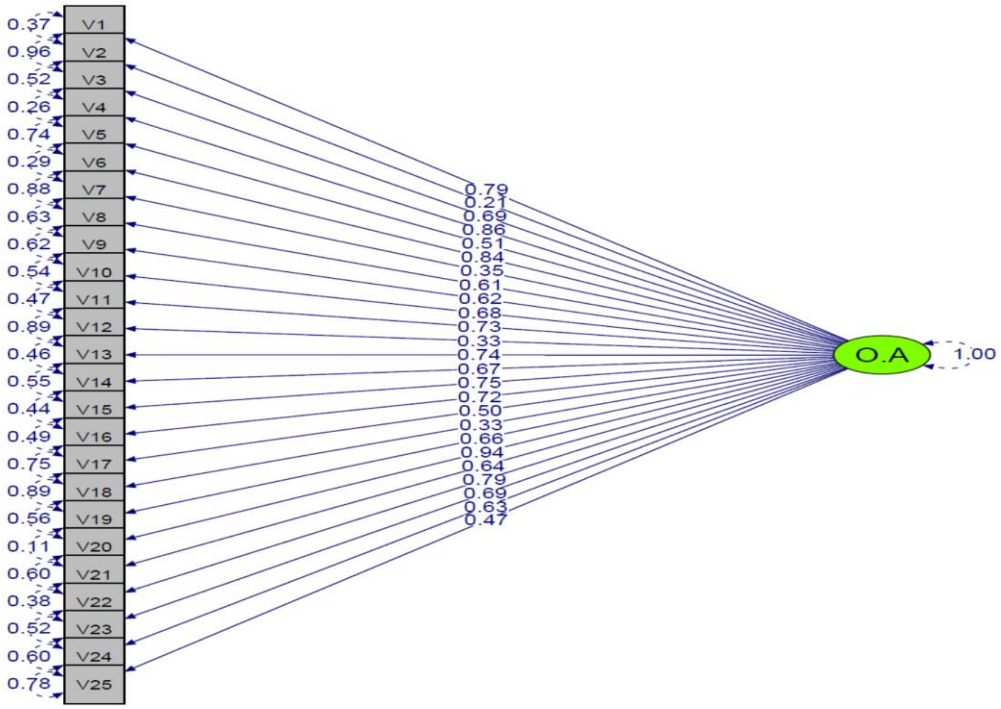


**Figure 4. CFA Results for the STEP-P Anger Attribution Dimension of the Emotions Subtest (Standard Coefficients)**

Figure 4 shows the CFA results for the Anger Attribution Dimension of the Emotions Subtest. In the CFA results for the evidence of construct validity with 25 items in the scale, χ^2⁄sd=1.51; RMSEA = 0.04; SRMR = 0.17; CFI = 0.97; TLI = 0.96. When Figure 4 is examined, it is seen that the factor loads are between 0.21 and 0.94. The KR-20 reliability coefficient calculated for the reliability of the measurements obtained with 25 items and 310 people using the scale is 0.83. The test-retest reliability is 0.57. Therefore, it can be said that the reliability of the measurements in terms of internal consistency is high.

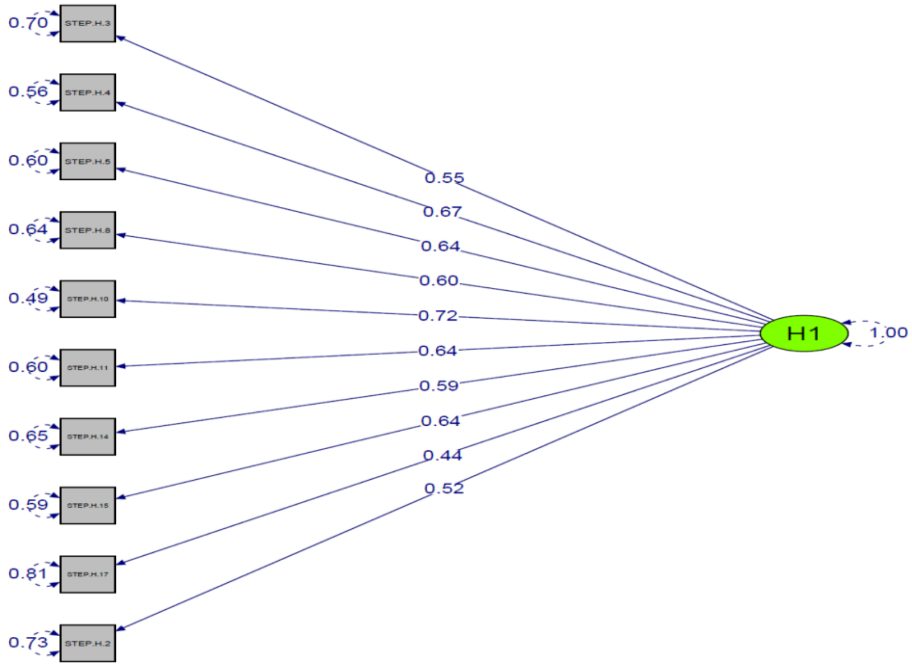


**Figure 5. CFA Results for the STEP-P Dimension of Positive Evaluation of Collaboration in the Goal Acquisition Subtest (Standard Coefficients)**

Figure 5 presents the CFA results for the STEP-P Dimension of Positive Evaluation of Collaboration in the Goal Acquisition Subtest. In the CFA results for the evidence of construct validity with 10 items in the scale, χ^2⁄sd=1.54; RMSEA = 0.04; SRMR = 0.08; CFI = 0.98; TLI = 0.97. When Figure 5 is examined, it is seen that the factor loads are between 0.44 and 0.72. The KR-20 reliability coefficient calculated for the reliability of the measurements obtained with 10 items and 310 people using the scale is 0.74. The test-retest reliability is 0.85. The independent inter-observer agreement is 0.99. Therefore, it can be said that the measurements are quite reliable in terms of internal consistency.

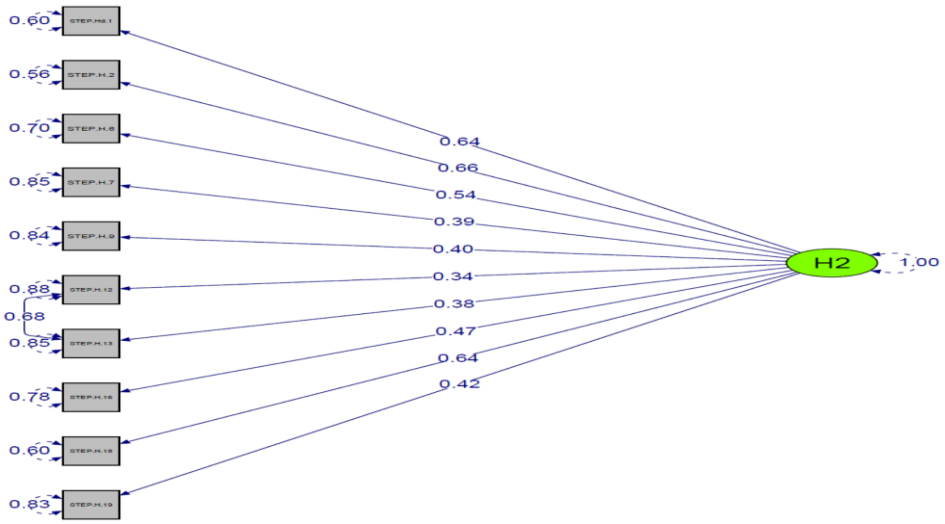


**Figure 6. CFA Results for the STEP-P Dimension of Positive Evaluation of Aggression in the Goal Acquisition Subtest (Standard Coefficients)**

Figure 6 shows the CFA results for the STEP-P Dimension of Positive Evaluation of Aggression in the Goal Acquisition Subtest. Model fit indices were improved by modifying items M12 and M13 according to the CFA results for evidence of construct validity with 10 items in the scale. After modification, χ^2⁄sd=2.08; RMSEA = 0.06; SRMR = 0.09; CFI = 0.94; TLI = 0.92. Therefore, it can be said that the model-data fit is at a good level. When Figure 6 is examined, it is seen that the factor loads are between 0.34 and 0.66. The KR-20 reliability coefficient calculated for the reliability of the measurements obtained with 10 items and 310 people using the scale is 0.64. The test-retest reliability is 0.83. The independent inter-observer agreement is 0.99. Therefore, it can be said that the measurements are quite reliable in terms of internal consistency.

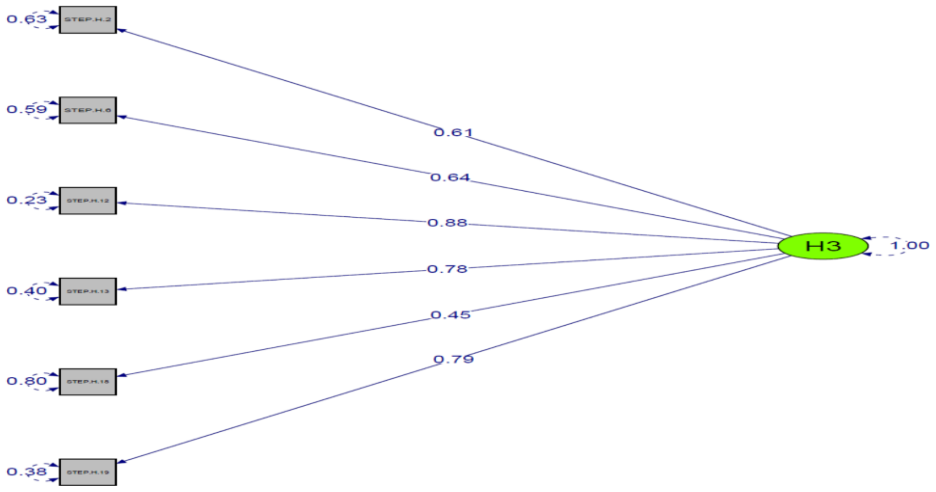


**Figure 7. CFA Results for the STEP-P Dimension of Moral Acceptability of Aggression in the Goal Acquisition Subtest (Standard Coefficients)**

Figure 7 shows the CFA results for the STEP-P The Dimension of Moral Acceptability of Aggression in the Goal Acquisition Subtest. In the CFA results for the evidence of construct validity with 6 items in the scale, χ^2⁄sd = 1.55; RMSEA = 0.04; SRMR = 0.08; CFI = 0.99; TLI = 0.98. When Figure 7 is analyzed, it is seen that the factor loads are between 0.45 and 0.88. The KR-20 reliability coefficient calculated for the reliability of the measurements obtained with 6 items and 310 participants using the scale is 0.69. The test-retest reliability is 0.71 and independent inter-observer agreement is 1.00. Therefore, it can be said that the measurements are quite reliable in terms of internal consistency.

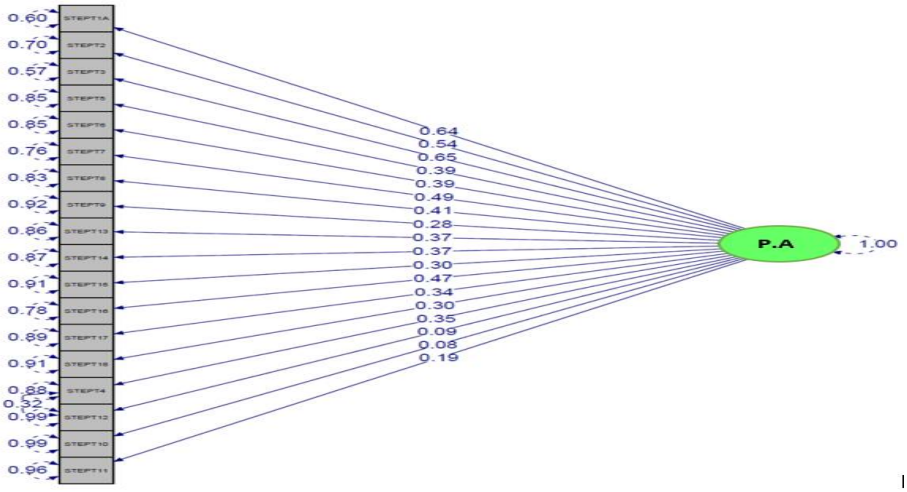


**Figure 8. CFA Results for the STEP-P "P.A" Dimension of the Provocation Subtest (Standard Coefficients)**

Figure 8 shows the CFA results for the STEP-P "P.A" Dimension of Provocation Subtest. Model fit indices were improved by modifying items M4 and M12 according to the CFA results for the evidence of construct validity with 18 items in the scale. After modification, χ^2⁄sd=1.58; RMSEA = 0.04; SRMR = 0.12; CFI = 0.82; TLI = 0.80. Therefore, it can be said that the model-data fit is at a good level. The KR-20 reliability coefficient calculated for the reliability of the measurements obtained with 18 items and 310 people using the scale is 0.60. The test-retest reliability is 0.58 and the independent inter-observer agreement is 0.99. Therefore, it can be said that the measurements are quite reliable in terms of internal consistency.

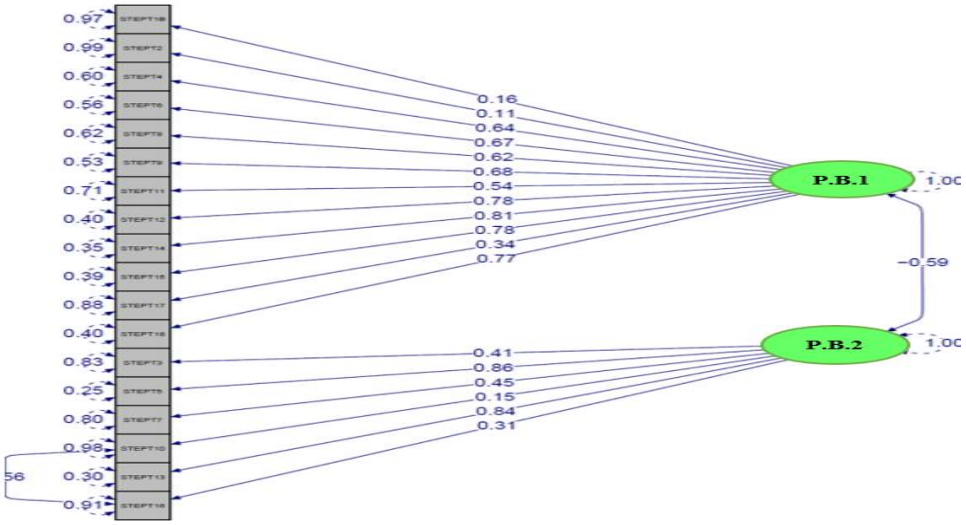


**Figure 9. CFA Results for the STEP-P "P.B" Dimension of Provocation Subtest (Standard Coefficients)**

Figure 9 shows the CFA results for the STEP-P "P.B" dimension of the Provocation Subtest. Model fit indices were improved by modifying items M10 and M16 according to the CFA results for the evidence of construct validity with 18 items in the scale. After modification, χ^2⁄sd=1.93; RMSEA = 0.06; SRMR = 0.11; CFI = 0.95; TLI = 0.94. Therefore, it can be said that the model-data fit is at a good level. The measurements obtained with 12 items and 310 people using the scale were named “P.B.1” and the KR-20 reliability coefficient calculated for its reliability was obtained as 0.76. “The measurements obtained with 6 items and 310 people using the scale were named “P.B.2” and the KR-20 reliability coefficient calculated for its reliability was obtained as 0.62. In addition, the test-retest reliability for the Provocation B questions was 0.72 and the independent inter-observer agreement was 1.00. Therefore, it can be said that the measurements are quite reliable in terms of internal consistency. As “P.B.1” item score increases, “P.B.1” also increases. As “P.B.2” item score increases, “P.B.2” also increases. However, there is a moderate negative correlation between “P.B.1” and “P.B.2” (r = -0.59). The “P.B.1-P.B.2” formula was used when calculating the score for the “B” dimension of the Provocation Subtest.

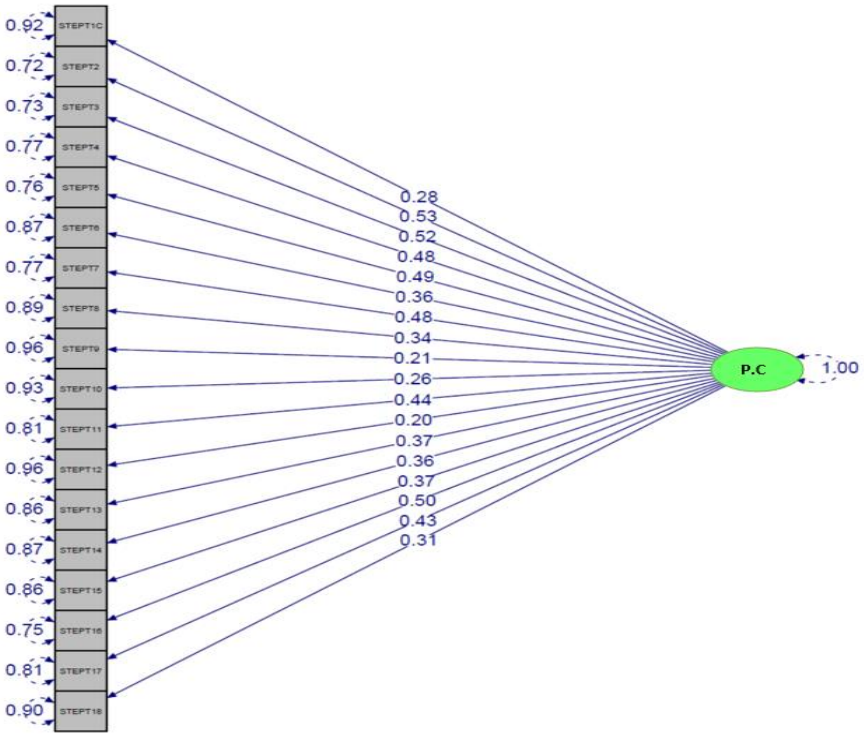


**Figure 10. CFA Results for the STEP-P "P.C" Dimension of the Provocation Subtest (Standard Coefficients)**

Figure 10 shows the CFA results for the STEP-P "P.C" dimension of the Provocation Subtest. In the CFA results for the evidence of construct validity with 18 items in the scale, χ^2⁄sd=1.16; RMSEA = 0.02; SRMR = 0.09; CFI = 0.95; TLI = 0.95. When Figure 10 is examined, it is seen that the factor loads are between 0.20 and 0.53. The KR-20 reliability coefficient calculated for the reliability of the measurements obtained with 18 items and 310 people using the scale is 0.64. The test-retest reliability is 0.67 and independent inter-observer agreement is 1.00. Therefore, it can be said that the measurements are quite reliable in terms of internal consistency.

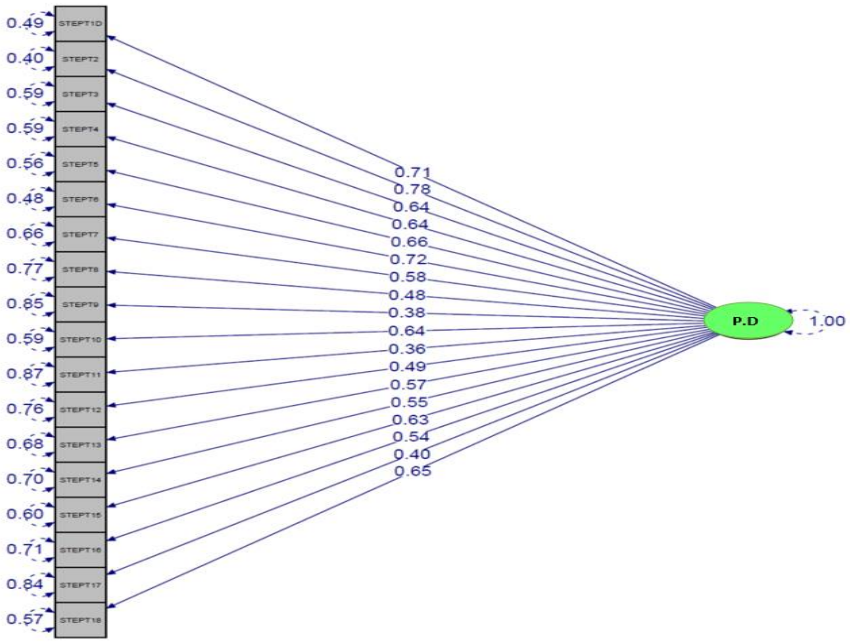


**Figure 11. CFA Results for the STEP-P "P.D" Dimension of the Provocation Subtest (Standard Coefficients)**

Figure 11 shows the CFA results for the STEP-P "P.D" dimension of the Provocation Subtest. In the CFA results for the evidence of construct validity with 18 items in the scale, χ^2⁄sd=2.86; RMSEA = 0.08; SRMR = 0.11; CFI = 0.94; NNFI = 0.93. When Figure 11 is examined, it is seen that factor loads are between 0.36 and 0.78. The KR-20 reliability coefficient calculated for the reliability of the measurements obtained with 18 items and 310 people using the scale is 0.77. The test-retest reliability is 0.83 and independent inter-observer agreement is 0.87. Therefore, it can be said that the measurements are quite reliable in terms of internal consistency.

The CFA results for the evidence of construct validity of the 18 items in the STEP-P "E" dimension of the Provocation Subtest are RMSEA = 0.00; TLI = 1.051; CFI = 1.00. This may be due to the correlations between the items or the very small sample size. Therefore, the single-factor model could not be evaluated (Mulaik, 2009). Descriptive statistics of the scores obtained in the STEP-P test are given in Table 2.

**Table 2. Descriptive Statistics of STEP-P Scores**

| | Number of Items | Min | Max | Mean | Standard Deviation | Skewness Shç: 0.138 | Kurtosis Shb: 0.276 |
|---|---|---|---|---|---|---|---|
| STEP-P.D2 | 25 | 0.00 | 16.00 | 2.41 | 3,19 | 1.79 | 3.13 |
| STEP-P.D1 | 18 | 3.00 | 18.00 | 15.83 | 3.49 | -1.88 | 2.88 |
| STEP-P.H1 | 10 | 0.00 | 10.00 | 5.54 | 2.70 | -0.06 | -1.02 |
| STEP-P.H2 | 10 | 0.00 | 10.00 | 4.32 | 2.38 | 0.19 | -0.33 |
| STEP-P.H3 | 6 | 0.00 | 6.00 | 2.10 | 1.64 | 0.75 | -0.11 |
| STEP-P.P.A | 18 | 0.00 | 13.00 | 4.41 | 2.67 | 0.51 | -0.10 |
| STEP-P.P.B.1 | 12 | 0.00 | 11.00 | 4.37 | 2.96 | 0.07 | -1.24 |
| STEP-P.P.B.2 | 6 | 0.00 | 6.00 | 3.50 | 1.65 | -0.17 | -0.73 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| STEP-P.P.C | 18 | 0.00 | 17.00 | 7.47 | 3.24 | 0.44 | 0.08 |
| STEP-P.P.D | 18 | 0.00 | 12.00 | 2.21 | 2.64 | 1.24 | 0.89 |
| STEP-P.P.B | 18 | -6.00 | 7.00 | 0.87 | 3.75 | -0.34 | -1.03 |

When Table 2 is examined, it is seen that the mean of the Anger Attribution Dimension of the Emotions Subtest of the STEP-P Scale is 2.41 and the standard deviation is 3.19. The mean of the Emotion Recognition dimension of the Emotions Subtest is 15.83 and the standard deviation is 3.49. The mean of the dimension of Positive Evaluation of Collaboration in the Goal Acquisition Subtest is 5.54 and the standard deviation is 2.70. The mean of the Positive Evaluation of the Aggression dimension in the Goal Acquisition Subtest is 4.32 and the standard deviation is 2.38. The mean of the Moral Acceptability of Aggression dimension in the Goal Acquisition Subtest is 2.10 and the standard deviation is 1.64. The mean of the Provocation Subtest P. The dimension is 4.41 and the standard deviation is 2.67. The mean of the Provocation Subtest P.B.1 dimension is 4.37 and the standard deviation is 2.96. The mean of the Provocation Subtest P.B.2 dimension is 3.50 and the standard deviation is 1.65. The mean of the Provocation Subtest P.C dimension is 7.47 and the standard deviation is 3.24, and the mean of the Provocation Subtest P.D dimension is 2.21 and the standard deviation is 2.64.

## 6. CONCLUSION AND RECOMMENDATIONS

The study aims to adapt the Schultz Test of Emotion Processing – Preliminary Version (STEP-P) into Turkish and to conduct validity and reliability analyses for 3-5 year old children. In this context, content validity (expert opinion) and construct validity (confirmatory factor analysis) were examined for the validity studies of the test. For content validity, the test was sent to 5 academicians, 1 with a doctorate in guidance and psychological counseling and 4 with a doctorate in child development and education, and expert opinions were obtained in terms of the suitability of the items to the relevant age group and the development area in terms of the appropriateness of the way the items were presented. All experts reported that the items in the scale are necessary and appropriate. Therefore, all items in the original form were used in the data collection process. Confirmatory factor analysis was conducted to examine the construct validity of the Schultz Test of Emotion Processing – Preliminary Version (STEP-P). The KR-20 reliability coefficient was calculated for the reliability of the measurements in terms of internal consistency. The Pearson correlation coefficient was calculated when the normality assumption was met and the Spearman correlation coefficient was calculated when the normality assumption was not met for independent inter-observer agreement and test-retest reliability. It was determined that the KR-20 reliability coefficient, which was calculated for the reliability of the Schultz Test of Emotion Processing – Preliminary Version (excluding dimension E) in terms of internal consistency, was found to be between 0.60 and 0.89 in the subscales and sub-dimensions. The fact that the KR-20 coefficient obtained from the 10-15-item tests is 0.50 and above indicates that the test is reliable (Alpar, 2022, p. 596). For independent inter-observer agreement and test-retest reliability, it was determined that the Pearson correlation coefficient calculated when the normality assumption was met and the Spearman correlation coefficient calculated when it was not met were between 0.57 and 1.00 in the subscales and sub-dimensions. Pearson and Spearman correlation coefficients between 0.40 and 0.69 indicate a medium-level relationship; between 0.70 and 0.89 indicate a high-level relationship; between 0.90 and 1.00 indicate a very high-level relationship (Alpar, 2022, p. 444). As a result of the analyses, it was determined that the Emotions Subtest, Goal Acquisition Subtest, and Provocation Subtest (except for the E dimension) of the Schultz Test of Emotion Processing – Preliminary Version (STEP-P) are valid and reliable measurement tools for 3-5 year old children.

The STEP-P consists of 62 short videos (5 to 15 seconds) and 62 items in total, including 24 items in the Emotions subtest, 20 items in the Goal Attainment subtest, and 18 items in the Provocation subtest. In line with

the results obtained in this study, it is thought that the administration of the scale in a larger sample may positively affect the validity and reliability levels of the scale.

## REFERENCES

Alpar, R. (2022). Spor Sağlık ve Eğitim Bilimlerinden Örneklerle Uygulamalı İstatistik ve Geçerlik Güvenirlik SPSS de Çözümleme Adımları ile Birlikte. Ankara: Detay.

Arsenio, W. F. (2010). Social Information Processing, Emotions, and Aggression: Conceptual and Methodological Contributions of The Special Section Articles. Journal of Abnormal Child Psychology, 38(5), 627-632.

Brody, L.R. (1985). Gender Differences in Emotional Development: A Review of Theories and Research. Journal Of Personality, 53, 102–149.

Castro, V. L., Cheng, Y., Halberstadt, A. G. & Grühn, D. (2015). EUReKA! A Conceptual Model of Emotion Understanding. Emotion Review, 1-11, doi: 10.1177/1754073915580601.

Cooke, T. (2017). Social Information Processing: A Useful Framework For Educational Psychology. Educational Psychology Research and Practice, 3(1), 50-69.

Crick, N. R. & Dodge, K. A. (1994). A Review And Reformulation of Social Information-Processing Mechanisms in Children's Social Adjustment. Psychological Bulletin, 115, 74-101.

Çokluk, Ö., Şekercioğlu, G. & Büyüköztürk, Ş. (2018). Sosyal Bilimler İçin Çok Değişkenli İstatistik: SPSS ve Lisrel Uygulamaları 5. Baskı, Ankara: Pegem Akademi.

Davies, P. T., Coe, J. L., Hentges, R. F., Sturge-Apple, M. L. & Ripple, M. T. (2020). Temperamental Emotionality Attributes As Antecedents of Children's Social İnformation Processing. Child Development, 91(2), 508-526. doi: 10.1111/cdev.13191.

De Castro, B. O. (2004). The Development of Social Information Processing and Aggressive Behaviour: Current Issues. European Journal of Developmental Psychology, 1(1), 87-102. doi: 10.1080/17405620444000058.

Dodge, K. (1991). Emotion and Social Information Processing (Ed. J. Garber, K. A. Dodge). The Development of Emotion Regulation and Dysregulation, Cambridge University Press, 159-181.

Dodge, K. A. (2003). Do Social Information-Processing Patterns Mediate Aggressive Behavior. Causes of Conduct Disorder and Juvenile Delinquency, 254-274.

Dodge, K. A. & Rabiner, D. L. (2004). Returning To Roots: On Social Information Processing and Moral Development. Child Development, 75(4), 1003-1008.

Dodge, K. (1985). Facets of Social Interaction and The Assessment of Social Competence in Children (Ed. B.H. Schneider, K.H. Rubin, J. E. Ledingham). Children's Peer Relations: Issues in Assessment and Intervention, Springer-Verlag, 3-22.

Dodge, K. A. (1986). A Social Information Processing Model Of Social Competence in Children (Ed: Marion Perlmutter). Cognitive Perspectives On Children's Social and Behavioral Development: The Minnesota Symposia on Child Psychology, Volume 18. Psychology Press, 77-125.

Dodge, K. A. (2003). Do Social Information-Processing Patterns Mediate Aggressive Behavior. Causes Of Conduct Disorder and Juvenile Delinquency, 254-274.

Healy, S. J., Murray, L., Cooper, P. J., Hughes, C. & Halligan, S. L. (2015). A Longitudinal Investigation of Maternal Influences on The Development of Child Hostile Attributions and Aggression. Journal of Clinical Child & Adolescent Psychology, 44(1), 80-92. doi: 10.1080/15374416.2013.850698.

Herba, C. & Phillips, M. (2004). Annotation: Development of Facial Expression Recognition From Childhood to Adolescence: Behavioural and Neurological Perspectives. Journal of Child Psychology And Psychiatry, 45:7, 1185–1198.

Howarth, G. Z. (2014). Temperament and Emotionally Regulated Reactions To Problem Situations in Preschool Classrooms: An Exploration of The Moderating Effects of Emotion Knowledge, Doctoral Dissertation, George Mason University.

Hu, L. & Bentler, P. M. (1999). Cutoff Criteria For Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives. Structural Equation Modeling, 6, 1-55.

Kline, R. B. (2015). Principles and Practice of Structural Equation Modeling. (Fourth Edition). NY: Guilford Publications, Inc.

Lemerise, E. A. & Arsenio, W. F. (2000). An Integrated Model of Emotion Processes and Cognition in Social Information Processing. Child Development, 71(1), 107-118.

Lewicki, P. (1984). Self-Schema and Social Information Processing. Journal of Personality and Social Psychology, 47(6), 1177-1190.

Macbrayer, E. K., Milich, R. & Hundley, M. (2003). Attributional Biases in Aggressive Children and Their Mothers. Journal of Abnormal Psychology, 112(4), 698-708. doi: 10.1037/0021-843X.112.4.698.

McDowell, D. J., Parke, R. D. & Spitzer, S. (2002). Parent And Child Cognitive Representations of Social Situations and Children's Social Competence. Social Development, 11(4), 469-486.

Mulaik, S.A. (2009). Linear Casual Modeling with Structural Equations. Boca Raton: Chapman & Hall / CRC.

Orobio De Castro, B., Merk, W., Koops, W., Veerman, J. W. & Bosch, J. D. (2005). Emotions in Social Information Processing and Their Relations with Reactive and Proactive Aggression in Referred Aggressive Boys. Journal of Clinical Child and Adolescent Psychology, 34(1), 105-116.

Raikes, H. A., Virmani, E. A., Thompson, R. A. & Hatton, H. (2013). Declines in Peer Conflict From Preschool Through First Grade: Influences From Early Attachment and Social Information Processing. Attachment & Human Development, 15(1), 65-82. doi: 10.1080/14616734.2012.728381.

Rosseel Y (2012). Lavaan: An R Package For Structural Equation Modeling. Journal of Statistical Software, 48(2), 1–36. doi: 10.18637/Jss.V048.İ02.

Runions, K. C. & Keating, D. P. (2007). Young Children's Social Information Processing: Family Antecedents and Behavioral Correlates. Developmental Psychology, 43(4), 838-849. doi: 10.1037/0012-1649.43.4.838.

Schönenberg, M. & Jusyte, A. (2014). Investigation of The Hostile Attribution Bias Toward Ambiguous Facial Cues in Antisocial Violent Offenders. European Archives of Psychiatry and Clinical Neuroscience, 264, 61-69, doi: 10.1007/S00406-013-0440-1.

Schultz, D., Logie, S. K., Ambike, A., Bohner, K., Stapleton, L., Vanderwalde, H., Min, C. & Betkowski, J. A. (2010). The Development and Validation of A Video-based Assessment of Young Children's Social Information Processing. Journal of Abnormal Child Psychology, 38, 601-613.

Schultz, D., Izard, C. E. & Ackerman, B. P. (2000). Children's Anger Attribution Bias: Relations To Family Environment and Social Adjustment. Social Development, 9(3), 284-300.

Schumacker, R. E. & Lomax, R. G. (2004). A Beginner's Guide To Structural Equation Modeling. (Second Edition). NJ: Lawrence Erlbaum Associates, Inc.

Thompson, B. (2004). Exploratory and Confirmatory Factor Analysis: Understanding Concepts and Applications. (First Edition). NY: Psychology Press.

Ziv, Y. (2013). Social Information Processing Patterns, Social Skills, and School Readiness in Preschool Children. Journal Of Experimental Child Psychology, 114, 306-320. doi: 10.1016/J.Jecp.2012.08.009.

Ziv, Y., Kupermintz, H. & Aviezer, O. (2016). The Associations Among Maternal Negative Control, Children's Social Information Processing Patterns, and Teachers' Perceptions Of Children's Behavior in Preschool. Journal of Experimental Child Psychology, 142, 18-35. doi: 10.1016/J.Jecp.2015.09.004.

**Funding:** The authors declare that no funds, grants, or other support were received during the preparation of this manuscript

**Ethical Approval:** The ethics committee approval of KTO Karatay University Non-Pharmaceutical and Non-Medical Device Research Ethics Committee dated 18/06/2019 and numbered 41901325-050.99 was obtained for the study. Research and publication ethics were complied with.

**Contribution Rate:** Authors contributed equally to the article.