Affect knowledge test: preliminary pscyhometric evaluation in a pakistani preschool sample

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Abstract- Emotions play a crucial role in children's life, from toddlerhood to adolescents, significant others play an important role in socializing different aspects of emotions in children. The school life of a preschooler is not a simple one, successfully navigating through the seemingly difficult social challenges , is dependent upon different types of skills and motivation. Western research is now replicate with instances of studies which focus on emotional knowledge of preschoolers and its consequent emotional well-being as well as school adjustment later. However, in third world countries like Pakistan, such researches are very few and far in between. In the present study the two main points under discussion are a) the importance and utility of a measure of emotional knowledge for preschoolers which is both developmentally and culturally appropriate and (b) preliminary psychometric evaluation of the Affect Knowledge Test in Pakistani culture. Furthermore, to establish the concurrent validity of AKT and for the said purpose the scoial competence of the preschoolers was also measured.

Key words: AKT, Psychometric Evaluation, Preliminary, Emotional Knowledge

I. INTRODUCTION

Emotion Knowledge and Early Childhood
Emotional competence in children increases gradually, research is replete with the evidence that their emotional competece has strong associations with both the concurrent and later social and acadmic outcomes (Denham, 2003; Denham, Brown, & Domitrovich, 2010; Denham & Burton, 2003). Children as young as three years of age are quite adept at various components of emotional competece. One such compeonent which develops early on is emotional knowledge. It generallhy refers to understaning their own as well as emotions in others (Denham, Zinsser, Brown, & Domitrovich, 2012). This understanding includes both understandin the basic emotions and the consequences of these emotions. Furhtmore, to have an insith into complex facets of emotions ffor instance that two people can have different emotional response to the same eliciting stimulus (Denham & Brown, et al., 2010).

Development of Emotion knowledge is an essential tool for preschoolers which equips them for later on school and social adjustment (Basset et al., 2012). Another important aspect to consider here is that such children having lower emtoional knowledge are rated lower by teachers in social functioning arena (Izard et al., 2001). Chidren who are better equiped at interpreting other's emotions are likely to succeffuly transit from preschool to school(Spivak & Farran, 2016).These children are also likely to get along well with the peer and hence have better social competence and are well adjusted to school. On the contrary, children who have some sort of deficit in are at an increased risk of negative outcomes such as aggression (Denham et al., 2002; Valiente, Swanson, & Eisenberg, 2012), low academic achievement and high internalizing and externalizing problems (Kujawa et al., 2014). These children are also rate low by the teachers on social functioning (Izard et al., 2001).

It is quite obvious from the aforementioned discussion that promotion of preschoolers' emotional knowledge helps in setting the trajectory of their social and emotional development along with the consequent school adjustment in the right direction (Bassett et al., 2012). However, despite the crucial impact of emotional knowledge on children's emotional and social well being, there is paucity of research in Pakistan. One of the causes might be parents' belief that emotional knowledge is acquired naturally by children, without any coaching or explicit instructions. Nonetheless, a shift is being observed in the importance parents' give to children's emotional wellbeing. More attention is being paid due to increase in problems related to Pakistani children's interpersonal communication and skills. For example school dropouts, refusal to go to school, and being absent from school for more than a month without any physical or health issue are on the rise in Pakistan (Malik, Siddiqui & Mahmood, 2019). There is ample amount of research which shows a close relationship between emotion knowledge and socially competent behavior, which specifically means or referred to as a child's ability to not only labeling of emotional expressions as

well as identifying the emotions that are being elicited by social situations (Denham, 1998; Denham et al., 2012).

Social competence is quite often related with the emotion knowledge development of the children. Hence, the need of hour is to provide valid and reliable assessment tools and measures, which can assist teachers in the assessment of emotion knowledge of the children. However, most of the empirical evidence for this social-emotional functioning comes from west (Inam et al., 2015). On the basis of aforementioned discussion, present study focuses to assess both structural and dimensional characteristics in the light off cultural difference between Pakistani and American culture.

Affect knowledge test (AKT) has gone through quite elaborate psychometric evaluation in the Western culture (Basset et al., 2015; Denha, 1986; Denham et al., 2012; Sette, et al., 2015). It was concluded by Denham (2006) that as AKT doesn't require verbal ability, its ecological validity is high. Another important thing to consider is that it is easily understood and requires only twenty minutes for administration. Additionally, it was reviewed that other studies which used photographs (e.g., Masuda et al., 2008) for emotional expression and understanding similar to the ones used in AKT are quite appropriate for preschoolers, minimizing gender biases It also requires minimal verbal abilities. Hence, it is more appropriate to be used with preschool sample to measure their emotional knowledge. This is moe so as some children develop verbal abilites earlier than others which might impact the results obtained on emotional knowledge from any test which makes use of verbal communication (Curby et al., 2015) .Considering the previous cross-cultural adaptations of the AKT(Sette et al., 2015), there are some factors that should be under consideration. One of such factors is that both American and Pakistani cultures are substantially different. The makeup of American culture is essentially independent, whereas Pakistani culture is more dependent in nature where group dynamics and harmony is valued more (Khayyam, Ullah, & Shah, 2018). Open emotional expression is encouraged in independent cultures as a sign of autonomy (Masuda et al., 2008). Whereas, interdependent cultural encourage suppression of the negative emotions (Khalid & Sunikka-Blank, 2017). Hence, in Pakistani culture covering negative facial expression is highly reinforced through the process of socialization (Finch et al., 2018).

In American schooling system, children's classroom assignments changes every year. Similarly, preschool children in Pakistan have different teachers and they have same peers for the whole preschool period. Furthermore, the familial context is quite in contrast in both North American countries (where the instrument was initially validated) and Pakistan. In American culture autonomy and independence are the most valued attributes (Trommsdorff & Heikamp, 2013) whereas, in Pakistan both social cohesion and family are considered to be the most important factors (Finch et al., 2018). Pakistani parents, and this is especially true for mothers, are responsible for the transition of the important social relationships in the family, which is characterized by social cohesion and mutual support. It is therefore concluded that emotion knowledge might play a pivotal role in establishing sensitive and cooperative relationships, where social cohesion is the primary goal of socialization.

Furthermore, assessment of emotion knowledge can assist teachers not only in knowing what is the level of emotional development of particular child but can further support in the consequent social skills, both concurrently and across time. In the end we conclude that although both Pakistan and America have sharp cultural differences, but we don't expect a different emotion knowledge structure in both America and Pakistan. This is due to the fact that both development and expression of emotion has a universality (Saarni & Harris, 1991). AKT has also been validated in Japeanese culture, whose makeup is similar to Paksitan. Though certain differnces were idientified in both cultures regarding the facial exprssions used in AKT, overall similar factor stucture was identified.

Objectives of the Study

The main objectives of the study were to establish the initial psychometric properties of AKT, assess the factor structure of AKT, and to obtain the evidence of convergent validity for the tool.

II.   METHODOLOGY

After obtaining permissions from the respective authors of the scales , the study was conducted following the guidelines provided by Brislin (1970) in following steps;

Step 1. Forward translation
Step 2. Selection of the most suitable items through committee approach,
Step 3. Back translation into the source language.
Step 4. Committee approach.

Authors of the scale holds the copy rights of the instruments, therefore authors were contacted and their consent was sought regarding the use and translation of the instruments. After their permission the process of translation was initiated. Translation of the instruments was carried out in the light of the guidelines

provided by Brislin (1970), which included ensuring that there was maximum similarity of the content between target and source language. In the next step a team of three translators was selected . The criteria for the selection of the members of the team is that the members' education level was at least MS/MPhil. They were all bilinguals, proficient in both source and target language. Translators with technical expertise in the field of Psychology were preferred. They were instructed to translate the measure bearing in mind that the translated version would be as close to meaning as possible to the origianl instrument. Three tranlsated versions were obtained.

A committee comprising of expert judges was formed, who were asked to choose the best translated items. This choice was made from the three translated versions of the instruments. The judges' committee consisted of one professor in psychology, and two PhD scholars. They were proficient in both target (Urdu) and source (English) languages, as well as having expertise in the subject area of psychology. All the translations were reviewed carefully by the committee, and the best compatible option was selected. Author approved the use of word school instead of preschool, and the word school was retained in the final translated version of the AKT. Similary, item no 6 in the " How my Child Feels" part of AKT mentions " Going into the water in Swimming pool". Most of the children in Pakistan don't have an experience of going to a Swimming pool . Author was informed about this cultural differnce and was asked about changing the statement to Going into the water. She gave her consent of changing it to Going into the water. After reviewing recommendations and incorporating the changes mentioned the translated version of the instrument was finalized. The final step was that of obtaining the back translations. Three back translations were obtained from three bilinguals, slected on tthe same criteria as the translators in the first step. These back translations were assessed by the review committee and a final back translated version was prepared. This final back translated version was sent to the author for approval. Finally, in order to establish the concurrent validity of the AKT, Social Competence Scale-Teacher Version was used. It was assumed there would be a positive association between cooperative and sensitive behavior of the children and emotion knowledge, as reported by the teachers.

Sample
Participants were 3-5 year-old Pakistani preschoolers (N = 227 with boys n = 122 and girls n = 95). The sample size was determined using the recommendations provided for the appropriate sample size, for the use of the tool in the target culture (Sousa & Rojjanasrirat, 2011). A post hoc power analysis was performed (G* Power 3.1), to check the appropriateness of the sample size(Razali & Wah 2011). From the inter-scale correlation with significance level α = .05, two-tailed, and effect size = .47, the current study had a statistical power of .94. This indicated that the study has a sufficient power for the determination of significant correlations.

Instruments
Affect Knowledge Test. How my child feels is a part of Affect Knowledge Test (Denham, 1986), which is a measure that assesses children's emotional knowledge from 3 to 5 years. How my child feels is filled by the parent prior to actual administration of the test . It has 12 items. This tool assesses both verbal and nonverbal emotional recognition of the children. It also taps on how well children recognize emotions if they are provided with certain contextual information. For the emotion labeling and recognition AKT uses schematic representation o the four basic emotions of happy, sad, angry, and scared expressions to the children. The child is asked to verbally identify each face in random order. Experimenter then presents the faces to the child in a new random order and ask the child to point to the face as the experiemnter is providing a verbal label for the emotion. On both tasks a score of 0 is given if the child provides a wrong label for the emotion, 1 for correct valance but wrong emotion and 2 for correct emotion and correct valance. Both expressive and receptive scores are combined ot create emotioon recognition aggregate score.

The second part of the AKT is aimed to assess a child's ability to identify emotions. Same schematic faces are used , but here the experimenter engages in a phase which is called teaching phase. In this phase the experimenter uses both facial expressions and physical demonstrations to teach the child all the emotions assessed. Several short vignettes are then read and acted out with the aid of puppet. As each vignette completes the experimenter asks the child what emotion the puppet is feeling and select an emotional face.

These vignettes are either stereotypical or non-stereotypical. Stereotypical are in which the puppet is displaying the same emotion as a child is likely to feel in such a situatin. Whereas, in the non-stereotypical vignettes the puppet displays an emotion in contrast to what the child would experience in such a situation. For instance parents have reported that a child's least favorite food is beans, the puppet acts happy while eating beans. Same scoring procedure ranging from 0-2 is used for each vaginette. AKT is a reliable measure (Version A: α = .74) (Denham et al., 2002).

Social Competence Teacher Version Scale (SCTV). The *Social Competence Scale - Teacher Version* has 25-items. It is a part of the Fast Track Project. The scale has good reported reliability (α = .74) and validity. The scoring categories are three 0 for doesn't apply, 1 for applies and 2 for definitely applies.

Procedure

Research was conducted by following procedure. The project was thoroughly discussed with the heads/principles of the schools. After obtaining consent of the principals of the schools, research met the preschool teachers. Both the purpose of the research and the queries and concerns of the teachers was thoroughly explained. Participants were selected from the classrooms where the teachers had agreed to participate. However, a hesitation was observed by the researcher in teachers' participation in research. Their concerns were mainly related to the additional work demand their participation in the current research would warrant. There was a slight modification in the recruitment strategy in response to these concerns. It was decided that teacher's cooperation would only be sought when parents gave their consent to participate in the research. At the recruiting time exact number of the students and the time required for the participants would be informed at the recruitment time. As a result of these modifications all the teachers agreed to participate in the research.. Their rights to anonymity and confidentiality was conveyed and they were also informed that they can quit at any stage of their own accord. Students' data were collected in the classrooms of preschoolers during regular school days. The researcher first sent the questionnaire "How my child feels" to the parents, upon return of this questionnaire, the second step of the data collection started. The second step consisted of administration of AKT whereas, data from the teachers through questionnaires was also collected at approximately the same time as the preschoolers' data were collected.

III. RESULTS

In order to establish the preliminary psychometric properties of the Affect Knowledge Test-Translated Version (AKT-TV), internal consistency for reliability was assessed. All the inter item correlation were well within the range (from .57 to .87). Furthermore, the construct-related validity was established by measuring the inter-scale correlations. These analyses were performed in the light of the recommendation for analytical strategies for the cultural adaptation of a tool (e.g., Sousa & Rojjanasrirat, 2011).The results of the descriptive stats are also shown in the table 1. Inter-rater reliability was also computed. For the said purpose two raters evaluated 30 children and scored AKT simultaneously. Both raters were PhD scholars, and were from the field of psychology.

Table 1

Psychometric properties of Affect Knowledge Test and its sub scales of Emotional Recognition and Situational Recognition(N=227)

Scales	k	α	*M*	*SD*	Range Potential	Actual	Skewness	Kurtosis
AKT	28	.79	10.06	4.8	0-56	15-52	.68	-1.28
ER	8	.66	8.03	3.3	0-16	2-14	-.72	-.89
SR	20	.73	23.23	10.38	0-40	11-38	.57	1.18

Note. k = no. of items. AKT=Affect Knowledge Test, SR= Situational Recognition, ER= Emotional Recognition

Table 1 shows that Cronbach's alpha for scales is good ranging from .66 o .79. Distribution of the scores is also normal as the values of skewness and kurtosis are within the prescirbed range of -3 to 3 (Brown, 2006). Furthermore, Pearson correlation to study relationship among the study variables was calculated. Table 3 shows the correlation analysis.

Table 2

Correlation between the subscales and total scores of Urdu version of Affect Test (AKT)

Scales/Subscales	1	2	3
AKT	-	.74**	.94**
ER		-	.45**
SR			-

Note. ER= Emotional Recognition, SR=Situational Recognition, AKT= Affect Knowledge Test
*p <.05, **p <.01

Table 2 shows that the subscales of Affect Test are significantly positively related to the overall scale as well as with each other, which reflects high level of construct validity. Inter class correlation was computed for

the inter rater reliability of AKT. A degree of reliability was found between two raters. The average measure of ICC WAS .92 with 95% confidence interval from .866-.960 (F29, 162) = 14.2, $p < .001$.

Before initial analysis and subsequent hypotheses testing, it was important to first validate this instrument (AKT) to use in this study, to ensure its validation in Pakistani culture. Therefore, to confirm factor structure of AKT, Second Order Confirmatory Factor Analysis (CFA) was done. The goodness of fit of all the models was determined using multiple fit indices, including chi-square (χ^2) and relative normed chi-square (χ^2/df), comparative fit index (CFI), incremental fit index (IFI), goodness of fit index (GFI), and root mean square error of approximation (RMSEA) criteria needed for decision that the findings of CFA supported the analyzed instruments as equally applicable and valid in Pakistani culture. According to Brown (2006), goodness of fit is indicated by a value of RMSEA .08 or lower. Whereas the values of CFI, GFI, and IFI should be higher than .95. Similarly, the SRMR values not above .10 are recommended.

Table 3

Second Order CFA (Indices of model fit) for AKT Scale (N =227)

Model	χ^2(df)	χ^2/df	GFI	IFI	CFI	RMSEA	SRMR
M1	562.180 (349) p = .000	1.61	.84	.72	.71	.05	.06
M2	362.310 (323) p = .065	1.12	.97	.95	.96	.02	.05

Note. GFI = Goodness of fit index; IFI = Incremental Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.
M1 = Default Model of CFA for (AKTS); M2 = Model after adding error covariance.

Table 4

Second Order Factor Loadings and Squared Multiple Correlations for the AKTS (N = 227)

Scales/Subscales	Item Nos.	Default Model		Model Fit	
		λ_1	SMCs	λ_2	SMCs
ER	1	.49	..25	.35	.26
	2	.59	.34	.43	.22
	3	.36	.25	.46	.24
	4	.35	.26	.45	.27
	5	.52	.27	.59	.35
	6	.59	.35	.49	.23
	7	.45	.20	.40	.22
	8	.41	.37	.43	.21
SR	9	.37	.33	.39	.33
	10	.43	.32	.42	.27
	11	.54	.36	.34	.33
	12	.43	.28	.47	.21
	13	.45	.20	.48	.23
	14	.57	.32	.56	.31
	15	.33	.25	.37	.22
	16	.48	.25	.51	.26
	17	.36	.35	.32	.33
	18	.37	.30	.31	.20
	19	.36	.34	.36	.22
	20	.42	.26	.31	.23
	21	.33	.24	.33	.22
	22	.30	.22	.30	.22
	23	.46	.21	.44	.26
	24	.44	.20	.46	.21

25	.37	.24	.36	.25
26	.21	.18	.34	.32
27	.16	.02	.33	.22
28	.34	.11	.34	.20
ER		.87	.76	1.0	1.10
SR		.84	.70	.79	.63

Note. λ = Factor Loadings; SMCs = Squared Multiple Correlations; *ER= Emotional Recognition, SR=Situational Recognition.*

The factor loadings and Squared Multiple Correlations SMCs for AKTS indicate two-factor structure. For default model, all the items of AKTS indicate the values of factor loadings and squared multiple correlations ranging from (ER λ_1 = .35-.59, SMCs = .20-.37; SR λ_1 = .30-.57, SMCs = .02-.36). The criteria given by Bian (2011), the factor loadings of items >.30 and SMCs of the same items are below the threshold of .20 as per the criteria given by Hooper, Coughlan, and Mullen (2008) should be deleted to improve the model. As the model fit indices are not in the acceptable range, therefore, the model was modified by adding the error covariance. Hence, the values of factor loadings and squared multiple correlations of all items of model fit ranging from (ER λ_2 = .35-.59, SMCs = .21-.35; SR λ_2 = .30-.56; SMCs = .20-.33). Therefore, Model 2 shows a model fit with all values falling within acceptable range.

Table 5

Table 5 shows correlation between AKT and its subsclaes Emotional Recognition(ER) and Situational Recognition (SR) with Social competence teacerh version scale (SCTVS). All the associations are in the predeicted directions, with subscales ER and SR having significant positive correlations with the SCTVS.

Correlation between study variables (N =227)

Variables	1	2	3	4
AKT	-	.74**	.94**	.14*
ER		-	.48**	.16*
SR			-	.18*
SCTVS				-

Note. AKT= Affect Knowledge Test, ER= Emotional Recognition, SR= Situational Recognition, SCTVS= Social communication Teacher Version Scale

*p <.05, **p <.01.*

IV. DISCUSSION

This article presents the endeavor to determine the preliminary psychometric evaluation of the AKT in Pakistani preschoolers. Another objective of the study was to establish the validity evidence of the translated version. Results indicated that there is a high internal consistency for all the subscales of the AKT. Furthermore, all the subscales of AKT namely emotion knowledge and situational understanding, are well correlated with one another. This provides the evidence for the construct validity of the translated version. Thus, these findings clearly highlight that the Urdu translated version of the AKT is a valid and reliable measure to be used with Pakistani preschoolers.

In a sample of American preschoolers that both emotion recognition and situation knowledge are distinct skills of emotion knowledge (Basset et al., 2012). Hence, it is important to know that whether this aforementioned structure of AKT would be confirmed in different social settings. Hence, the aim of the current study was determine the factor structure of the AKT, with Pakistani preschoolers. Similar to the previous studies a two-factor structure was confirmed with Pakistani preschoolers. The findings of the current study adds to the already existing literature (e.g., Baseet et al., 2012; Valiente et al., 2012) addressing the factor structure of AKT; findings of both these studies and the current study suggest that there might be a structural uniformity in the development of the emotion knowledge, especially in young children.

Furthermore, this inference of emotion knowledge as having two distinct factors is not only limited to AKT, but studies that utilize a measure other than AKT support this notion. For instance a study conducted by Valiente and colleagues (2012), supports this claim. The tool used in the study was the Emotion Understanding Assessment (Yuki, Maddux, & Masuda, 2019) in a preschool sample. They concluded that both emotion recognition and perspective taking during any emotional situation, represent two highly distinctive, yet interrelated factors.

To further explore AKT's validity, a social competence measure (Social Competence Teacher Version) was administered on the sample. The findings validate the hypothesis that both emotion knowledge and social

competence are significantly related. These findings are in accordance to the model developed by Bassett et al. (2012), which suggests social behaviors are highly related to emotion knowledge of the children. This relationship is especially true for the situational understanding and the socially competent behavior of the children (Denham, 1998). The present study also established a highly significant association between these two factors. The results support the supposition that knowledge of emotion is quite intricately woven with the socially competent behavior, which is indicated through the ability of the children to interact and form relationships with others which are both meaningful and successful (Shao et al., 2015; Denham et al., 2003; Wang, 2001; Widen & Russell, 2003).

V.   CONCLUSION

It can be concluded that this study represent an essential step towards the adaptation of the AKT in Pakistani culture. The next step suggested by the researcher is a more comprehensive evaluation of validity of AKT. Once fully validated it can prove to be a very useful tool to assess the base-line emotion knowledge of Pakistani preschoolers. Understanding the emotion development of the children might in turn assist in the implementation of any intervention program aimed at monitory the children who are in need of emotion knowledge development and the consequent impact on their social-school adjusment. In addition to this continued cross-cultural adaptation of the AKT might deepen our understanding of the universal and cultural-specific aspects of emotional development of children.

VI.   IMPLICATIONS AND LIMITATIONS

Regardless of the importance of the findings of the current study, the nature of the data is cross-sectional and therefore should be handled with caution. Hence, in order to better understand the emotion knowledge development and the consequent social development, longitudinal studies are required. Nonetheless, our findings suggest that AKT might be used as a screening tool, to help teachers, as they can help children on labeling emotions and comprehending the emotional cures in the social situations (Widen & Russell, 2003).

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