

A study on age as determinant of empathetic feeling among single women employed in private sector banks in Chennai Metro

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Abstract - When watching others in pain, women's brains show more empathy. Christov-Moore (2019) found that that females are better at feeling others' pain, at really getting the feeling that the other person is having right now. Female participants in the study showed relatively higher activation in a sensory area of the brain associated with pain than their male counterparts. Empathy is the ability of a person to understand the emotional make-up of other people. It also involves skill in dealing with people according to their emotional reactions; At the very least, empathy requires being able to read another's emotions; at a higher level, it entails sensing and responding to a person's unspoken concerns of feelings. At the highest levels, empathy is understanding the issues or concerns that lie behind another's feelings. Current study focusses on the level of feeling of empathy by women who are single and are employed in private sector banks in Chennai city.

keywords - Empathy, single women, emotional re actions, feelings

I. INTRODUCTION

Empathy is the ability to understand and to share the internal states of others (Christov-Moore et al., 2014; Noten et al., 2019). Although an agreement on the concept of empathy is not clearly found in the literature, most researchers agree that it involves a multidimensional process that includes three basic elements: affect sharing, mentalizing, and prosocial concern (Christov-Moore et al., 2014; Noten et al., 2019). Affect sharing means vicariously sharing targets' internal states between one and others. Some authors also named it emotional contagion and relate it with the tendency to automatically mimic and synchronize facial expressions, vocalizations, postures, and movements with those of another person.

Other authors have classified the previous components in affective empathy (affect sharing), cognitive empathy (mentalizing or perspective taking), and prosocial behavior skills (Retuerto, 2004; Calvo et al., 2008; Zaki and Oschner, 2012; Balconi and Canavesio, 2014). In addition, another aspect related with the empathic process concerns the facial emotional recognition; this gives the possibility to decode others' internal states from facial expressions (Hall and Masumoto, 2004; Balconi and Canavesio, 2014). Thus, the empathic responses present the interest to allow us to react in the most socially appropriate way in order to interact successfully with others in the daily life (Singer, 2006) including social networks (Schmaelzle et al., 2017). In summary, the empathic process is important for social interactions and involves affective empathy (sharing), cognitive empathy (mentalizing) linked with facial emotional recognition, and behavioral aspects like prosocial concern.

Regarding the process of facial emotional recognition, it has been suggested that it is related with a specific visual scan pattern, in which those who look at the eyes for a longer period of time show greater accuracy and speed to recognize emotions than those who spent less time looking on eyes' area (Hall and Masumoto, 2004; Calvo et al., 2008; Balconi and Canavesio, 2014). Some studies have reported participants spent more time looking at the eyes area in emotionally stimulus than neutral, highlighting the notion that eye-to-eye encounters are critical to successful engage social interactions (Mason et al., 2005; Cowan et al., 2014). In addition, some clinical abnormalities in socially directed eye-gaze patterns to facial features exhibit low-emotional empathy, such as schizophrenia, or autism (Klin et al., 2002; Joshua and Rossell, 2009). In this context, it has been reported that empathy traits and gender can influence the visual scanning linked to emotional recognition (Balconi and Canavesio, 2014; Cowan et al., 2014; van Rijn et al., 2014). Otherwise, empathy traits have been described as the qualities or the empathic tendencies that people identify in themselves (Hoffman, 1977; Davis, 1980). They are usually determined by using self-reported scales such as the Interpersonal Reactivity Index (IRI) (Davis, 1980) or the Balanced emotional empathy scale (BEES), among others (Hemmerdinger et al., 2007). Thus, some authors have related empathy traits with the emotional recognition as evaluated through facial scanning (Balconi and Canavesio, 2014).

An important study reported the influence of social empathy on processing of emotional facial expressions (Balconi and Canavesio, 2014). Using the BEES scale, participants were classified in two groups, with high and low empathy traits. Then, positive and negative facial statics stimuli were presented to participants who had to categorize each emotional expression (Balconi and Canavesio, 2014). The high-empathy group showed shorter reaction times, longer durations, and greater number of fixations on the eyes and mouth regions than those obtained in the low-empathy group. These differences were mainly observed in faces showing emotions of joy, fear, and anger (Balconi and Canavesio, 2014). The authors concluded that

empathy trait, when assessed through eye movements, may have a significant impact on cognitive and attentional processes of emotional facial expressions. However, in this study, the influence of gender was not determined.

In this regard, it has been reported that women are faster and more accurate to recognize emotional expressions than men, especially emotional expressions of joy, anger, and surprise (Hall and Masumoto, 2004; Hall et al., 2010). This advantage has been related to the fact that women show longer fixations on the eyes' region of faces than men (Hall et al., 2010). However, only one of these studies determined the participants' empathy trait, and no gender differences were reported (Hall et al., 2010). In the remaining studies, where empathy trait was not assessed, it is not clear at what point it influences visual scanning and emotional recognition. This is particularly relevant when considering studies reporting that empathy trait is usually higher in women than men (Davis, 1980; Riggio et al., 1989; Mestré-Escrivá et al., 2004). In addition to the fact that studies did not consider together empathy trait and gender, the use of static stimulus constitutes another limitation for several studies about empathic processes. Indeed, it has been suggested that the use of repetitive static stimulus is a potential source of fatigue and habituation that might have limited the ecological value of their findings (Balconi and Canavesio, 2014). On the contrary, dynamic stimuli exalt natural emotional expressions, which allows to evoke empathic responses (including emotional recognition), and to evaluate empathic processes more accurately (Regenbogen et al., 2012; Cowan et al., 2014).

Although some studies have evaluated the empathic process using dynamic stimulus and recorded eye movements in clinical populations (van Rijn et al., 2014; van Goozen et al., 2016; Hubble et al., 2017; van Zonneveld et al., 2017), they did not determine the influence of empathy trait or gender. As far as we know, only one study has included typical adult population, empathy trait, and dynamic stimuli (video) to compare neutral and sad emotions (Cowan et al., 2014). The researchers reported a positive correlation between the subject's levels of empathy concern (evaluated by IRI scale) and the fixation duration on the eyes' region of the emotional stimulus. Besides, they reported that subjects with high levels of empathy concern were more accurate in recognizing emotion facial expressions. They thus suggested that the empathic level predicts the ability to recognize emotional facial expression. It is important to note that participants in this study were all women; hence, the trait of empathy in men is not known nor the gender differences. Therefore, the role of gender on the empathic process is not yet clear.

The aim of present study was to assess the extent of empathetic responses (emotional recognition, affective, and cognitive empathy linked with prosocial behaviour), using dynamic emotional stimuli (joy, anger, fear, and neutral) and eye movement recordings, in women who are single as far as their marital status is concerned. Empathic trait and responses were evaluated by administering questionnaires (consisting of questions pertaining to empathetic traits) to 200 women who are single either voluntarily (never married, divorced), or non- voluntarily (widowed).

II. REVIEW OF LITERATURE

Zimmer and Anderson (1968) explored the dimensions of positive regard and empathy. This study isolated, for a single counselling session, factors that contribute to the constructs of positive regard and 123 were trained to rate empathy. Their ratings of 100 counsellor responses were factor analysed. 8 principal factors were extracted for each construct and a varimax rotation was executed. The factors were labelled and it was concluded that positive regard and empathy were not unidimensional, but rather a construct composed of orthogonally related factors.

Assimacopoulos (1987) discriminated sympathy and empathy while dealing with death of a loved one. She expressed that the grieving process can occur in a cyclic manner in which persons might go back and forth between protest, despair and detachment before reaching a point of recovery. Secondly, physical and emotional "symptoms" and behaviour in loss are accepted as part of the normal process of grieving. Thirdly, emotional pain are felt. Finally, she concluded that by working through one's own experiences in loss and grieving, the individual acquires a sense of empathy to enable them to understand and guide others. Stotland and Smith (1994) presented a conception of empathy as a process in which the individual shares an emotion with another because he/she perceives the other to be experiencing that emotion. The core of the empathizing process has shown to be imagining the other's feelings, which is effected by social, individual, learning and motivational factors.

They explained that empathy consists of experiencing an emotion as a consequence of observing its occurrence in another person. This conceptualisation involves the process of generating empathy through attention to the other's emotion and imagining what the other is experiencing emotionally. Because people can learn from experiencing empathy and its consequences, they may be motivated to empathise in some situations, to avoid empathising in others or to escape from empathy eliciting situations. The authors propose that people regulate their social relationships so as to optimise empathised emotional experiences, on the one hand and regulate empathic experiences to serve social relationships on the other.

Research Methodology

Primary: A questionnaire was administered to 200 single women residing in Chennai Metro city. This was trimmed down to 182 responses based on the relevance of responses. Snowball sampling technique was adopted. Single women who were employed in private sector banks in Chennai Metro and were in the age group of 20-50 were surveyed by administering questionnaires through google form.

Secondary: M.Phil/ PhD Thesis, Journals and other periodicals.

The data so collected was statistically analysed using statistical packages. Statistical tools fit were descriptive statistical analysis tools- percentage analysis, chi square test, correlation and discriminant analysis, .

Background of the study

In the patriarchal Indian society, Women, unless have been supported by a male partner, are not still fully accepted by the society, in spite of the modernisation and western culture followed by many in the country, more specifically in a metro city like Chennai, where people appear to accept various aspects of modernisation, but, when it comes to women, are still reluctant

to accept their “single” marital status. They have always been looked down upon. This has negatively impacted their personality, especially their empathetic traits, which has always been an essential trait.

Objectives of the study

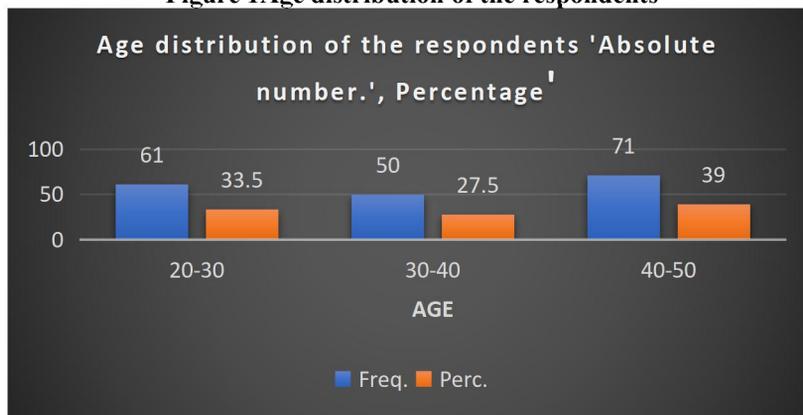
1. To identify the extent of empathetic feelings among single women employed in Private sector banks in Chennai Metro City
2. To investigate if age has a significant association with empathetic feelings of the respondents
3. To investigate if the nature of work has a significant association with empathetic feelings possessed by the respondents

Questions asked

- E1- I appreciate my friends’ positive qualities.
- E2-I can put myself in someone else's shoes.
- E3- I can tell when my close friend is upset.
- E4- I cannot know about people's pain and problems unless they talk about it.
- E5- I do not care how others might feel.
- E6- I'm not emotional and I'm not moved by other person’s emotional experiences.
- E7- While sitting alone or daydreaming, I recollect pleasant events and happenings.
- E8- I feel lonely and have very few good friends.

III. RESULTS AND DISCUSSION

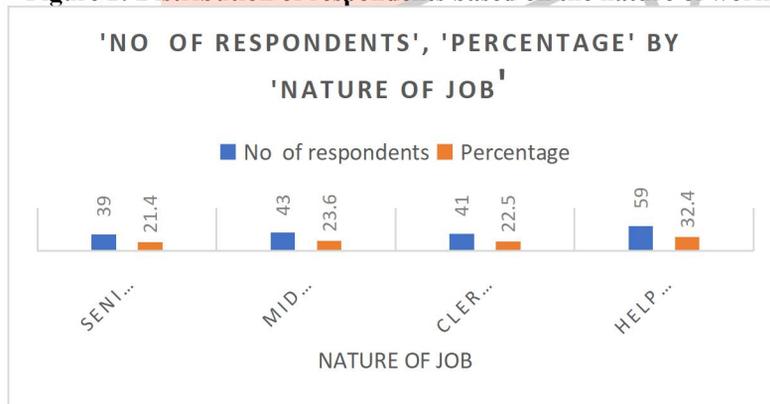
Figure 1Age distribution of the respondents



Source: Analyses were based on the sample surveyed

Majority of the respondents(71 and 61, thirty nine and over thirty three per cent) were of the age group 40-50 and 20-30 respectively while only a few of them belonged to the age group 30-40.

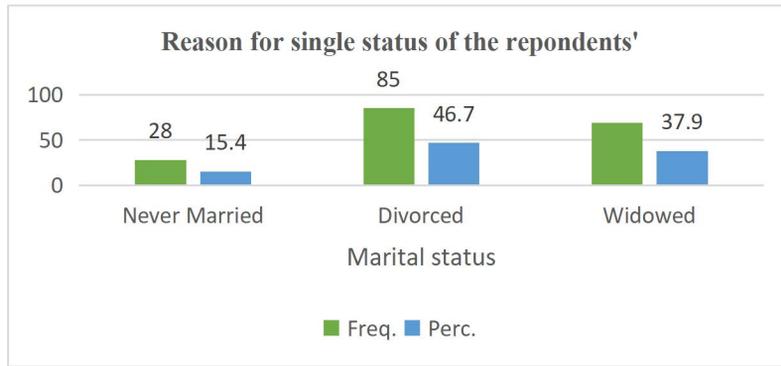
Figure 2: Distribution of respondents based on the nature of work



Source: Analyses were based on the sample surveyed

There more or less equal distribution of employees from all cadres of the job. Over twenty one percent of the respondents belonged to the senior level manager cadre, while a little less than twenty four percent of the respondents belonged to the middle level managerial grades. About twenty two and a half percent of the respondents worked in clerical cadre and a little more than thirty two percent of the respondents were from the helpers category.

Figure 3 Reason for singularity of the respondents



Source: Analyses were based on the sample surveyed

Figure 3, above shows the reason for the respondents’ single status as marked by them in the schedule administered to them. Majority of the respondents (a little less than forty seven percent) were divorcees, while about thirty eight of them were widowed. Only a few, over fifteen per cent of the respondents had never married.

The below listed hypotheses were tested by applying chi-squared test at 5% significance level and the results are summarized in the table below

Hypotheses

1. Ho: Age of the respondents has no significant association with their empathetic feelings
2. Ho: Nature work of the respondents has no association with their empathetic feelings
3. Ho: reason for singularity of the respondents has no association with their empathetic feelings

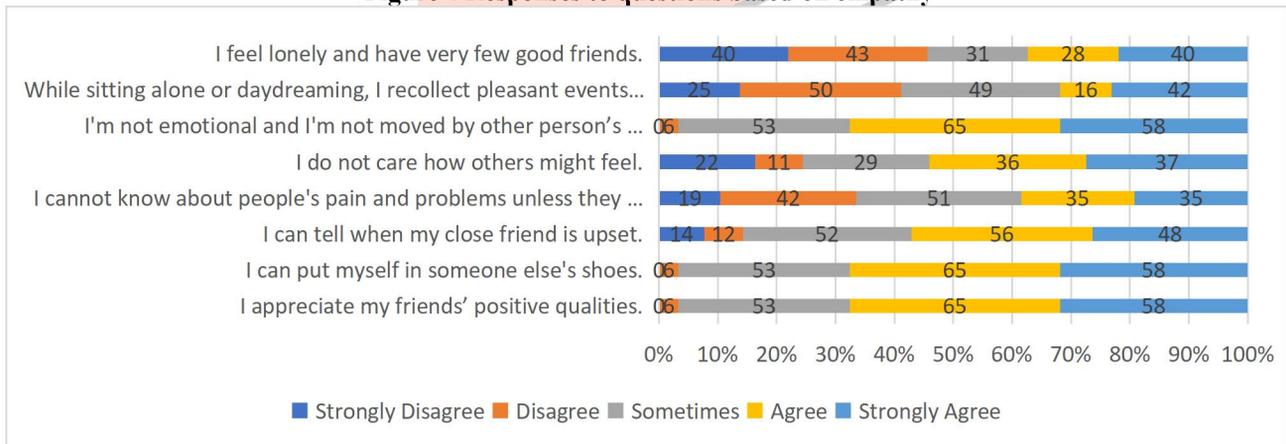
Table 1 : Chi Square test results of results of relationship between socio economic status and empathy feelings of the respondents

Relationship between socio-economic status and social skills of the respondents	Degrees of freedom	Table Value	Calculated Value	Results Of Hypothesis
Factors				
Age	18	28.869	32.462	Rejected
Nature of work	18	28.869	30.736	Rejected
Reason for Single status of the respondents	20	31.4104	28.6325	Accepted

Source: Analyses were based on the sample surveyed

From the above table1, it can be said that Age and nature of work have significant association with the respondents’ feelings of empathy while, their reason for single status has no association with their feelings of empathy.

Figure 4 Responses to questions based on empathy



Source: Analyses were based on the sample surveyed

Figure 4, above, depicts the responses indicated by the women surveyed to questions related to empathetic feelings possessed by them. Majority of them have disagreed (some of them have even strongly disagreed) to feeling lonely or having few friends. Majority of them can appreciate their friends’ positive qualities and put themselves in the other person’s shoes, some them are neutral to this. Very few have disagreed (6 out of 182). Most of them can even understand, the mood of their close friend when he or she is upset. These are some of the positive responses as far as feelings of empathy are concerned.

While for questions like not emotional and not being moved by other people’s feelings, and not caring for others, and not knowing about others feelings majority have agreed and many of them have even strongly agreed with these facts that they don’t get moved by others’ feelings, they don’t care about others’ feelings. Though many are also neutral, only a few have disagreed with these facts. To get a better understanding of this bi-polar views of the respondents, discriminant analysis is carried out to understand the respondents’ views better.

Discriminant Analysis

Table 2 Group Statistics

Age		Group Statistics			
		Mean	Std. Deviation	Valid N (listwise)	
				Unweighted	Weighted
20-30	E1	3.9016	.94348	61	61.000
	E2	3.9016	.94348	61	61.000
	E3	3.9672	.83601	61	61.000
	E4	3.4754	1.19173	61	61.000
	E5	3.5082	1.34936	61	61.000
	E6	3.9016	.94348	61	61.000
	E7	3.0164	1.10290	61	61.000
	E8	2.1311	1.14710	61	61.000
30-40	E1	4.0200	.79514	50	50.000
	E2	4.0200	.79514	50	50.000
	E3	4.0200	.82040	50	50.000
	E4	2.8000	1.04978	50	50.000
	E5	3.6600	1.18855	50	50.000
	E6	4.0200	.79514	50	50.000
	E7	2.5600	1.10951	50	50.000
	E8	2.6800	1.39152	50	50.000
40-50	E1	3.9718	.84468	71	71.000
	E2	3.9718	.84468	71	71.000
	E3	3.0282	1.37292	71	71.000
	E4	3.0845	1.40149	71	71.000
	E5	3.4930	1.35091	71	71.000
	E6	3.9718	.84468	71	71.000
	E7	3.0423	1.39833	71	71.000
	E8	3.7606	1.33593	71	71.000
Total	E1	3.9615	.86277	182	182.000
	E2	3.9615	.86277	182	182.000
	E3	3.6154	1.16836	182	182.000
	E4	3.1374	1.26484	182	182.000
	E5	3.5440	1.30267	182	182.000
	E6	3.9615	.86277	182	182.000
	E7	2.9011	1.23981	182	182.000
	E8	2.9176	1.46744	182	182.000

Source: Analyses were based on the sample surveyed

Group Statistics – This table presents the distribution of observations into the three groups within empathy factors. We can see the number of observations falling into each of the three groups. In this example, we are using the default weight of 1 for each observation in the dataset, so the weighted number of observations in each group is equal to the unweighted number of observations in each group.

Analysis 1

Table 3 Summary of Canonical Discriminant Functions

Eigenvalues				
Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.389 ^a	82.3	82.3	.529
2	.083 ^a	17.7	100.0	.277

Source: Analyses were based on the sample surveyed

a. First 2 canonical discriminant functions were used in the analysis.

This provides information on each of the discriminate functions (equations) produced. The maximum number of discriminant functions produced is the number of groups minus 1. We are only using three groups (age) here, namely 20-30,30-40 and 40-50, so only two function is displayed. The canonical correlation is the multiple correlation between the predictors and the discriminant function. With only one function it provides an index of overall model fit which is interpreted as being the proportion of variance explained (R^2). In our table age group has a canonical correlation of .529 suggests the model explains 27.98% and the other group of variance has 7.67% of the variation in the grouping variable, i.e. whether a each group of age respondent explains their empathy.

Table 4 Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	Df	Sig.
1 through 2	.665	72.085	12	.000
2	.923	14.126	5	.015

Source: Analyses were based on the sample surveyed

Wilks' lambda indicates the significance of the discriminant function. This table indicates a highly significant function ($p < .000$) and provides the proportion of total variability not explained, i.e. it is the converse of the squared canonical correlation

Table 5 Standardized Canonical Discriminant Function Coefficient

	Function	
	1	2
E1	.078	.245
E3	-.497	.340
E4	-.055	-.614
E5	-.091	.364
E7	.046	-.515
E8	.729	.250

Source: Analyses were based on the sample surveyed

The interpretation of the discriminant coefficients (or weights) is like that in multiple regression. Table above provides an index of the importance of each predictor like the standardized regression coefficients (beta's) did in multiple regression. The sign indicates the direction of the relationship. Self-concept score was the strongest predictor while low anxiety (note -ve sign) was next in importance as a predictor. These two variables with large coefficients stand out as those that strongly predict allocation to the age group. E4 and E7 attitude score were less successful as predictors.

Table 6 Structure Matrix

	Structure Matrix	
	Function	
	1	2
E8	.879*	.224
E3	-.688*	.352
E4	-.118	-.702*
E7	.102	-.555*
E1	.031	.176*
E2 ^b	.031	.176*
E6 ^b	.031	.176*
E5	-.036	.175*

Source: Analyses were based on the sample surveyed

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions
Variables ordered by absolute size of correlation within function.

*. Largest absolute correlation between each variable and any discriminant function

b. This variable not used in the analysis.

Table above provides another way of indicating the relative importance of the predictors and it can be seen below that the same pattern holds. Many researchers use the structure matrix correlations because they are considered more accurate than the Standardized Canonical **Discriminant Function Coefficients**. The structure matrix table shows the correlations of each variable with each discriminate function. These Pearson coefficients are structure coefficients or discriminant loadings. They serve like factor loadings in factor analysis. By identifying the largest loadings for each discriminate function the researcher gains insight into how to name each function. Here we have E4 and E7 (low scores) which suggest a label of knowing others' feelings and recalling happy moments, alone as the function that discriminates between the respondents' belonging to the age group 20-30 and age group 30-40. Generally, just like factor loadings, 0.30 is seen as the cut-off between important and less important variables. Absence is clearly not loaded on the discriminant function, i.e. is the weakest predictor and suggests that work absence is not associated with smoking behaviour but a function of other unassessed factors.

Table 6 Canonical Discriminant Function Coefficients

	Function	
	1	2
E1	.090	.283
E3	-.462	.316
E4	-.044	-.494
E5	-.070	.278

E7	.037	-.420
E8	.565	.193
(Constant)	-.053	-1.047

Source: Analyses were based on the sample surveyed

Unstandardized coefficients

The canonical discriminant function coefficient table

These unstandardized coefficients (b) are used to create the discriminant function (equation).

It operates just like a regression equation. In this case we have:

Age (20-30) = .090 E1 -.462 E3 -.044 E4 -.070 E5 + .037 E7 +.565 E8 -.053

Age (30-40) = .283 E1+.316 E3 -.494 E4 + .278 E5 -.420 E7 + .193 E8 -1.047

The discriminant function coefficients b or standardized form beta both indicate the partial contribution of each variable to the discriminate function controlling for all other variables in the equation. They can be used to assess each IV’s unique contribution to the discriminate function and therefore provide information on the relative importance of each variable. If there are any dummy variables, as in regression, individual beta weights cannot be used and dummy variables must be assessed as a group through hierarchical DA running the analysis, first without the dummy variables then with them. The difference in squared canonical correlation indicates the explanatory effect of the set of dummy variables.

Table 7 Functions at Group Centroids

Age	Function	
	1	2
20-30	-.620	-.283
30-40	-.322	.441
40-50	.759	-.067

Source: Analyses were based on the sample surveyed

Unstandardized canonical discriminant functions evaluated at group means A further way of interpreting discriminant analysis results is to describe each group in terms of its profile, using the group means of the predictor variables. These group means are called centroids. These are displayed in the Group Centroids table. In our example, age group 1- have a mean of -.620 while age group3 produce a mean of .759. Cases with scores near to a centroid are predicted as belonging to that group.

Classification Statistics

Table 8 Prior Probabilities for Groups

Age	Prior	Cases Used in Analysis	
		Unweighted	Weighted
20-30	.335	61	61.000
30-40	.275	50	50.000
40-50	.390	71	71.000
Total	1.000	182	182.000

Source: Analyses were based on the sample surveyed

Finally, there is the classification phase. The classification table, also called a confusion table, is simply a table in which the rows are the observed categories of the dependent and the columns are the predicted categories. When prediction is perfect all cases will lie on the diagonal. The percentage of cases on the diagonal is the percentage of correct classifications. The cross validated set of data is a more honest presentation of the power of the discriminant function than that provided by the original classifications and often produces a poorer outcome. The cross validation is often termed a ‘jack-knife’ classification, in that it successively classifies all cases but one to develop a discriminant function and then categorizes the case that was left out. This process is repeated with each case left out in turn. This cross validation produces a more reliable function. The argument behind it is that one should not use the case you are trying to predict as part of the categorization process.

Table 9 Classification Results^a

	Age	Predicted Group Membership			Total	
		1.00	2.00	3.00		
Original	Count	20-30	41	10	10	61
		30-40	19	14	17	50
		40-50	17	7	47	71
	%	20-30	67.2	16.4	16.4	100.0
		30-40	38.0	28.0	34.0	100.0
		40-50	23.9	9.9	66.2	100.0

Source: Analyses were based on the sample surveyed

a. 56.0% of original grouped cases correctly classified.

The classification results reveal that 91.8% of respondents were classified correctly into ‘smoke’ or ‘do not smoke’ groups. This overall predictive accuracy of the discriminant function is called the ‘hit ratio’. Age group 20-30 were classified with slightly better accuracy (67.2%) than age group 30-40 (34%) and age group 40-50 (28%).

IV. SUMMARY AND CONCLUSION

To conclude, it can be said that Age and nature of work have significant association with the respondents' feelings of empathy while, their reason for single status has no association with their feelings of empathy.

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