

*Dr. Madan Mohan Dutta\**

## ***Perception of Buyers of Comprehensive Passenger Carrying Vehicle Insurance in the State of West Bengal***

*Passenger-carrying vehicles are a common sight on the roads of India. We will be financially affected when the vehicle we own meets with an accident.*

*The purpose of the research has been to study the customer's perceptions of comprehensive passenger-carrying vehicle insurance in West Bengal and determine the variable which significantly influence's the buyers.*

*Our study has been to find out the factors influencing the buyer in his purchase decision with the help of exploratory factor analysis. This analysis was used to reduce variables and its further application in the structure equation model test.*

*The measurement model and the structure model, has been used in the structure equation model in order to determine the significant variables influencing a comprehensive passenger-carrying vehicle insurance buyer in West Bengal.*

*The result of the study indicated that secure feeling is the significant variable influencing a purchaser to buy a comprehensive passenger-carrying vehicle insurance policy in West Bengal.*

*Key words: Comprehensive Insurance Policy, Passenger Carrying Vehicle Insurance, Exploratory & Confirmatory Factor Analysis, Structure Equation Model and Path analysis.*

### **1. Introduction**

#### **Passenger-Carrying Vehicle Insurance**

Passenger-carrying vehicles are a common sight on the roads of India. We will be financially affected when the vehicle we own, meets with an accident. The commercial

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vehicles are used to carry passengers from one place to another in return for the money.

Motor vehicles are categorized into three groups for insurance purposes:

- a) Private cars
- b) Two wheelers
  - Motorcycles
  - Scooters
- c) Commercial vehicles
  - Goods carrying vehicle
  - Passenger-carrying vehicles, such as taxis, buses, and auto-rickshaws
  - Other vehicles, such as ambulances and mobile dispensaries

There are two types of automobile insurance policies:

- a) Liability-only policy (third-party insurance)
- b) Comprehensive policy (third-party liability plus damage to the owner's vehicle)

In India, third-party vehicle insurance provides coverage to third-party bodily injury and property damage, and it is mandatory. Comprehensive policy covers the risk of damage to the vehicle, passengers and third-party risk. Our study is related to comprehensive passenger-carrying vehicle insurance policies covering damage to the vehicle along with accidental death or injury to the owner, driver or other passengers, which are optional and not compulsory.

The fundamental problem that has been studied is to determine factors and variables perceived by a passenger-carrying vehicle comprehensive insurance policy buyer of West Bengal as significant. This problem is essential and to be addressed by the insurance companies in order to gain customer's confidence.

There is a lack of studies in this sector. This research will help to reduce the gap in studies that exists in this sector. The other chapters of the paper are arranged in the following manner. The review of the literature section covers relevant studies. The methods applied to understand the buyer's perception have been explained in the methodology section. The results and data analysis section covered the exploratory factor analysis and structure equation model. The conclusion section covered the summary of the paper.

## 2. Review of Literature

The Automobile insurance sector continues to be most extensive line of business for the general insurance industry in India. This sector accounted for about 34% of the general insurance premiums earned in the financial year 2020-21.

Rathore, T.C. (2014) analyzed the study of vehicle insurance companies in India with particular reference to car insurance in India from 1999-2009. The study revealed that motor car insurance would continue to remain the largest category in the contribution of premiums to the insurance industry due to the rising number of new vehicles on Indian roads. Arif, U.T. & Sirajuddin, K. (2016) analyzed policy holder's perception towards Motor vehicle insurance (with particular reference to Pollachi Taluk in Coimbatore district). The results revealed that faith in the insurance company is the most essential variable impacting a policyholder to choose a particular insurance company. Gurung, J.B. (2016) studied the insured's perception towards insurance services in Pokhara. The study revealed that the perception of the insured's towards insurance services is satisfactory in Pokhara valley, Nepal. Festus, M.E. & Philip, A.O. (2016) studied the effect of employee perception on the purchase of motor insurance at Joseph Ayo Babalola University, Nigeria. The study concluded that employees should consider consulting an insurance expert before purchasing an insurance policy instead of depending solely on their perception. Mallik, D.M. & Suhaib, S. (2018) studied customer awareness of car insurance policies with particular reference to United India Insurance, Shivamogga. The result revealed that United India Insurance Corporation is a leading insurance company in the field of vehicle insurance in terms of providing services to customers and their satisfaction. Ugwuanyim, G.U., Onwuegbuchunam, D.E., Bartholomew, D.C. & Anikpe, C.C. (2021) evaluated the performance of Motor Insurance companies in Nigeria through panel data analysis. The study revealed that claim settlement negatively affected premiums earned, and there were no policy impacts on vehicle insurance firm output.

There has been substantial work done on various fields of vehicle insurance in India and abroad. However perception study on buyers of passenger-carrying vehicle policy holders has not yet been taken up by the researchers.

### **3. Research Methodology**

#### **Objective of the Research**

The objective of the research has been to study customer's perceptions of comprehensive passenger carrying vehicle insurance in West Bengal. It is studied by the following means.

1. Buying decision of purchasers of passenger-carrying vehicle insurance policies in West Bengal was studied with the help of finance related factors, accidental factors, service-oriented factors and psychological factors by applying exploratory factor analysis.
2. Then the significant variable influencing a customer to buy comprehensive passenger-carrying vehicle insurance was derived with the help of the structure equation model.

#### **Data Source**

The primary data was used in the research. It was collected with the help of a questionnaire survey.

#### **Research Design**

The basic framework of the study was descriptive in nature.

#### **Population**

The population for the research was comprehensive passenger-carrying vehicle insurance policyholders of West Bengal.

#### **Sample Characteristics**

The research is in line with the objective being to study the customer's perception of comprehensive passenger carrying vehicle insurance in West Bengal. The sample of the research is results-driven and goal-oriented.

#### **Sampling Technique**

Convenience sampling was applied since the population mean and the standard deviation of the buyers are unknown. Further, purposive sampling was used as they are relevant to the study.

### **Sample Scale used for Survey**

A 5-point likert scale was used to obtain respondent's opinions. Here, importance of variables in the decision to buy passenger-carrying vehicle insurance policy has been measured. The scale according to importance used in this study was Very important (5), Important (4), Cannot say anything (3), Unimportant (2) and Not important at all (1).

### **Size of Sample**

The total number of samples collected for the study was 195.

### **Data Analysis**

Statistical tools used for interpreting results were Exploratory Factor Analysis and Structure Equation Model consisting of Confirmatory Factor Analysis and Path Analysis.

### **Exploratory Factor Analysis**

It is a statistical method used to uncover the underlying structure of a relatively large set of variables without compromising on its real identity and to reduce dimension.

### **Structure Equation Model**

The structure equation model is a multivariate statistical analysis technique which is used to analyze the structural relationships. This technique uses a combined effect of factor analysis and multiple regression analysis.

### **Confirmatory Factor Analysis**

Indices commonly used to indicate the fitness of a model are mainly Chi-square, Chi-square significance, RMSEA, GFI, NFI, CFI, RFI, PCFI and PNFI.

### **Path Analysis**

It is a form of multiple regression analysis which is used to evaluate causal relationships between independent and dependent variables.

### **Software used**

Software used for the study was SPSS Statistics Version 21 and Amos Version 20.

#### 4. Data Analysis, Results and Findings

This chapter deals with the analysis, results and findings of comprehensive passenger-carrying vehicle insurance policyholders of West Bengal.

##### Customer's Perception attributes

Insurance policy buying leads to the transfer of risk from the insured to the insurance company. Passenger-carrying vehicle insurance policy provides a cover against events of unpredictable loss.

**Table 1: Customer's attribute**

Risk Perspective	Variables	Purpose of Buying	Attitude and Feelings
Financial Risk Aspect	Accident to Owner Driver, Accident to Paid Driver, Accident to Passenger, High Repair Expenses, High Towing Expenses, High Spares Expenses, Burglary & Robbery, Total Damage Claim, Mob Violence	Financial Loss Coverage	Helps in safeguarding financial loss, thus enhancing confidence in the use of the vehicle.
Accidental Risk Aspect	Poor Condition of Road, Traffic Jams, Lack of Driving Ability, High Daily Run, Speed Bump	Accidental Risk Coverage	Accidental loss of security, thus enhancing confidence in the use of the vehicle.
Psychological Aspect	Emotional Bonding, Secured Feelings	Psychological Risk Coverage	Emotional and mental security, thus enhancing confidence in the use of the vehicle.
Service Aspect	Influence of Associates, Brand Image, Customer Service, Cost of Insurance, Insurance Coverage, Policy Settlement	Influenced by Service factors	Adequate Service is provided, thus enhancing confidence in the use of the vehicle.

Source: Authors compilation.

Data analysis has been divided into two sections. Section 4.1 deals with Exploratory Factor analysis (EFA). Section 4.2 is about Structure Equation Model (SEM).

##### 4.1 Exploratory Factor Analysis of Passenger Carrying Vehicle Policyholders

Exploratory factor analysis (EFA) is a statistical technique used to uncover the underlying structure of a relatively large set of variables. Its goal is to find a smaller number of common factors that will account for the correlations (McDonald, 1985).

### Exploratory Factor analysis

Exploratory factor analysis using Principal Component Analysis (PCA) was conducted. Sample adequacy value (KMO) should be more than 0.5, and Reliability of variables in each factor must be more than 0.6 and found to be in line with the requirement. Communality of the variables is to be more than 0.5. Variables with low communalities were removed from the analysis since the aim of factor analysis is to try and explain the variance through the common factors (Child, 2006).

The rotated component matrix was also determined. A cross-loading occurs when a variable loads at 0.32 or more on two or more factors (Costello & Osborne, 2005). So, variables that are influencing two factors as per the rotated component matrix have been removed for better results and analysis. Thus the total number of variables was reduced from 22 to 10.

### Factor-wise variable description

Particulars	Factor	Variables
Core Attributes	1	Accident to paid driver (APD), Accident to owner-driver (AOD) and Accident to the passenger (AP)
Psychological influenced factor	2	Emotional bonding (EB) and Secured feelings (SF)
Financial loss-related factor	3	High spare expenses (HSE), High repair expenses (HRE) and Burglary and robbery (BR)
Services related factor	4	Brand image (BI) and Influence of associates (IA)

Source: Authors compilation.

### Reliability Statistics

Reliability is a measure of consistency and stability of the measure being used in the research. Cornbach’s alpha is a measure of internal consistency and was found to be above 0.6 of all the factors. To determine the reliability of a factor, Cornbach’s alpha is to be over 0.6 (Hair et al., 1998). Also, as per (Moss et al., 1998), Cornbach’s alpha of 0.6 is acceptable. Hence factors are reliable and consistent. Refer to the following table for details.

**Table 2: Reliability Statistics**

Particulars	Cornbach's Alpha	Item Count
Core Attributes (Factor 1)	0.800	3
Psychological Influenced Factor (Factor 2)	0.817	2
Financial Loss Related Factor (Factor 3)	0.645	3
Services Related Factor (Factor 4)	0.618	2

Source: Authors Computation (SPSS 21)

Pattern matrix is obtained with the extraction method of maximum likelihood and rotation method of Promax with kaiser normalization.

**Table 3: Pattern Matrix**

Pattern Matrix

	Factor			
	1	2	3	4
APD	.761			
AOD	.758			
AP	.728			
EB		.992		
SF		.682		
HSE			.756	
HRE			.574	
BR			.558	
B1				.907
IA				.522

Source: Authors Computation (SPSS 21)



**Table 4: Total variance explained by four factors**

Factor No.	Factors affecting purchase	Initial Eigen Values		
		Total	% of variance	Cumulative %
1	Core Attributes	3.166	31.66	31.66
2	Psychological Influenced Factor	1.506	15.06	46.72
3	Financial Loss-Related Factor	1.303	13.03	59.75
4	Services Related Factor	1.282	12.82	72.57

Source: Authors Computation (SPSS 21)

The first factor is core attributes, which accounted for the maximum percentage of the variance of (31.66%). The three control variables are Accident to Paid Driver (APD), Accident to Owner driver (AOD) and Accident to Passenger (AP), having factor loading points of .761, .758 and .728, respectively. The above variables have factor loading more than .60, which means passenger-carrying vehicle insurance buyers are more concerned about these variables, and insurance companies should pay attention to it while designing their policies.

The second factor is the psychological influenced factor. It explains (15.06%) of the variance and consists of two control variables.

The third Factor is the financial loss-related factor. It explains 13.03% of the variance and consists of three control variables.

The last factor is services related factor. It accounts for 12.82% of the variance containing two control variables.

#### **4.2 SEM of Comprehensive Passenger Carrying Vehicle Insurance Policyholders**

Structure equation modeling is a multivariate technique that incorporates analysis using both dependency and interdependency techniques and tries to validate a structure. In the market condition, there are variables which can be quantified and observed in the market and are called manifest variables. There are also unobserved variables that are identified with the help of the manifest variables and are called constructs. The policyholders in the market are also confronted with similar-type of the relationships between the observed and unobserved variables. So, in the study, both multiple regression for dependency relationship and exploratory factor analysis for interdependency relationship together is applied.

SEM consists of the following two components:

- (i) Measurement model (Confirmatory factor analysis) and
- (ii) Structural model (Path analysis).

### Assessing the measurement model through CFA

The goodness of fit of the measurement model is checked through the following statistics.

**Table 5: Summary Results of Confirmatory Factor Analysis**

Model Fit Summary	Recommended Values	Obtained Values
$\chi^2$	-	40.576
Degrees of Freedom	-	30
$\chi^2$ significance	P>0.05 (Insignificant)	0.094
$\chi^2$ /Degrees of Freedom	<5	1.353
Normed Fit Index	>0.90	0.928
The Goodness of Fit Index	>0.90	0.962
Comparative Fit Index	>0.90	0.980
Relative Fit Index	>0.90	0.892
Root Mean Square Error of Approximation	<0.06	0.043
Parsimony Normed Fit Index	>=0.05	0.619
Parsimony Comparative Fit Index	>=0.05	0.653

Source: Authors Computation (AMOS 20)

Fit indices and their acceptable thresholds were provided by Hooper, Coughlan and Mullen, (2008) and shown under the column recommended. Since the result obtained are all within the recommended value, so the model has a good fit. Refer to Annexure-1 for details.

Standardized regression weight & squared multiple correlations are checked to obtain significant variables.

**Table 6: Regression Weight and Squared Multiple Correlation**

Variables	Standardized Regression Weight	Squared Multiple Correlation
Accident to Paid Driver	0.745	0.555
Accident to Owner Driver	0.811	0.657
Accident to Passenger	0.722	0.520
Emotional Bonding	0.796	0.624
Secured Feelings	0.872	0.724
High Spares Expenses	0.653	0.433
High Repair Expenses	0.639	0.417
Burglary and Robbery	0.569	0.325
Brand Image	0.704	0.481
Influence of Associates	0.639	0.384

Source: Authors Computation (AMOS 20)

The high value of the standardized regression weights indicates the stronger influence of the construct on the variable. The squared multiple correlations indicate the percentage of the variance of the measured variables that can be explained with the help of the variations in the construct. The result shown in the above table indicates that the standardized regression weight of the variable Secured Feelings (SF) being 0.872 is the maximum. Also, squared multiple correlation indicates that 72.4% of the variance is being explained. Hence Secured Feelings has maximum influence on the customer to buy a passenger-carrying vehicle insurance policy. But other influencing variables are Accident to Owner Driver (AOD), Emotional Bonding (EB) and Accident to Paid Driver (APD). For details, refer to Annexure-2.

### **Structural Model by the application of Path Analysis:**

Path analysis is a subset of the structure equation model (SEM). SEM deals with manifest, latent and residual variables. A manifest variable can be measured and is the observed behaviour. Latent variables are factors obtained through exploratory factor analysis (EFA) and are unobserved behaviour. SEM is the application of both factor analysis and multiple regression analysis. Residuals are unexplained unobserved behaviour.

**Observed variables or Manifest are:**

AOD-Accident to Owner Driver, APD-Accident to Paid Driver, AP-Accident to Passenger.

EB-Emotional Bonding, SF-Secured Feelings.

HSE-High Spares Expenses, HRE-High Repair Expenses, BR-Burglary and Robbery.

BI-Brand Image, IA-Influence of Associates.

**Unobserved Variables or Latent ones are:**

F1- Core Attribute, F2- Psychological Influenced Factor

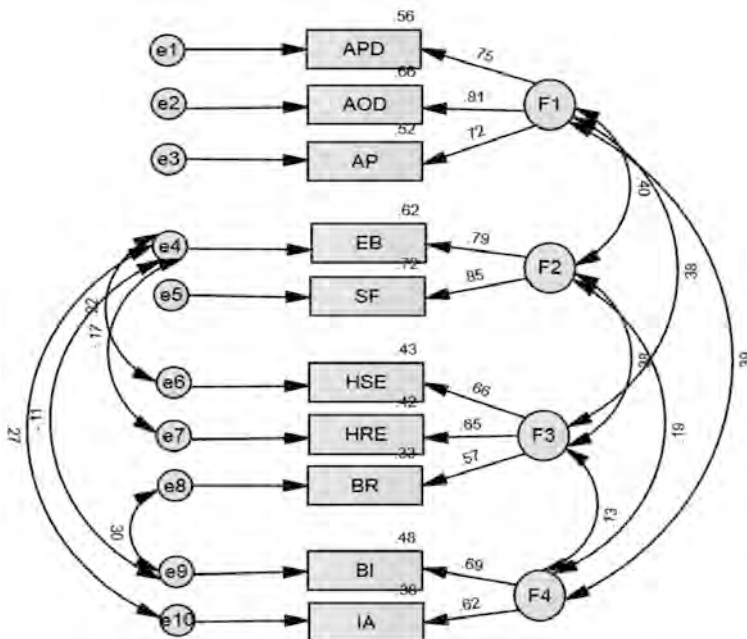
F3- Financial Loss Related Factor, F4- Service Related Factor

**Errors associated with Observed Variables are:**

e1 to e10

**Model 1:**

Figure 1: The modified model after modification is shown below with standardized estimates.



**Table 7: Summary of the Model**

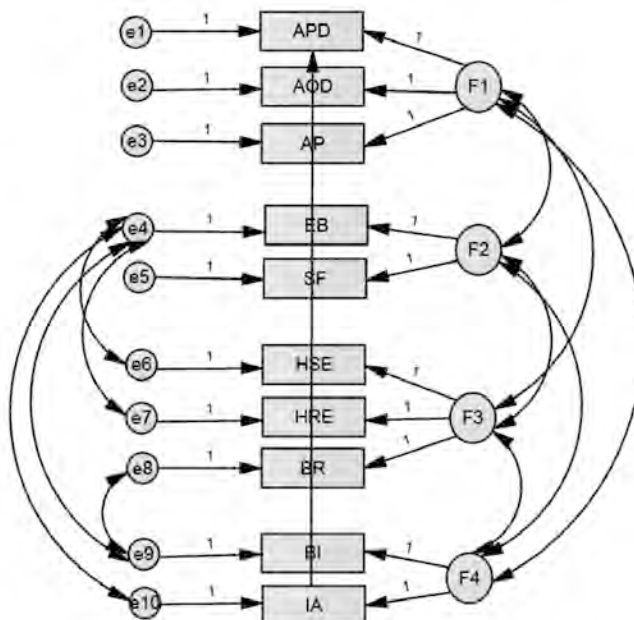
Model	Chi-Square	Degrees of Freedom	CMIN/Degrees of Freedom	Normed Fit Index	Comparative Fit Index	The Goodness of Fit Index	Root Mean Square Error of Approximation
Modified Model (Model 1)	40.576	30	1.353	0.928	0.980	0.962	0.043

Source: Authors Computation (AMOS 20)

The final modified model in Figure-2 with standardized estimates having a Chi-square value of 40.576, degree of freedom of 30 and probability value of 0.094, indicating that the model is fitting with the data. Other fit measures also indicate that the model is fitting with the data very well. (Minimum discrepancy divided by degrees of freedom (CMIN/df)=1.353, Normed fit index (NFI)=0.928, Comparative fit index (CFI)=0.980, Goodness of fit index (GFI)=0.962 and Root mean square error of approximation (RMSEA)=0.043). For details, refer to Annexure-1.

**Final Model**

Figure 2: Final modified Path diagram is shown below.



## **Findings of Passenger Carrying Vehicle Insurance Policy Holders**

The objective of our study has been to find out significant variables affecting the customer of a comprehensive passenger-carrying vehicle insurance policy.

Firstly, exploratory factor analysis using principal component analysis was used as a tool for data reduction. Some variables not meeting the required estimates were removed from the scope of further analysis. The pattern matrix was formed with the help of the existing variables.

Subsequent confirmatory factor analysis and path analysis was conducted to explore both dependency and interdependency relationship so as to find out significant variable.

The followings are the summary and interpretation of the analysis.

### **Findings of Exploratory Factor Analysis:**

1. The extraction method of maximum likelihood and rotation method of Promax with Kaiser normalization pattern matrix of the variables was obtained. As a result of exploratory factor analysis pattern matrix with ten variables spread over four factors was obtained.

### **Findings of Structure Equation Model:**

2. The statistics relating to the model fit summary suggest that the model has a good fit as the results obtained are all within the limit recommended.
3. Based on the result of the parsimonious comparative fit index (PCFI) and the parsimonious normed fit index (PNFI), the model is parsimonious as few variables explain a high percentage of the total variance.
4. The regression weights are statistically significant at less than a 5% level of significance. So dependency relationship in the model is established.
5. More than 72% of the variation in secured feelings is being explained and is the significant variable influencing a customer to purchase a comprehensive passenger carrying vehicle insurance policy in West Bengal.

## **5. Conclusions**

This study mainly focused on identifying factors and variables influencing a comprehensive passenger- carrying vehicle insurance buyer in West Bengal. A theoretical framework for passenger-carrying vehicle insurance policy holders along the

four perception dimensions was identified. Then empirical study to validate the theoretical framework was conducted by applying the exploratory factor analysis, confirmatory factor analysis and path analysis in order to find out significant variables. Empirical research has been summarized below.

- The result of the perception study of the purchasers of comprehensive passenger-carrying vehicle insurance indicates secured feelings as a significant variable. The vehicle is the primary source of income for most of the policy holder's, and insurance provides security from the risk. Hence insurance companies must look into it while framing their policy.
- Other influencing variables are accident to owner driver and accident to paid driver from a financial risk perspective and emotional bonding from psychological risk perspective. These variables are also crucial from the purchaser's point of view, and insurers must consider them.
- Competitions amongst insurance companies have been observed to be fierce. So the insurers are required to understand the perception of policyholders in order to satisfy their needs.
- The study is conducted to find out the significant variable influencing a purchaser of a comprehensive passenger carrying vehicle insurance policy based on the perception of the buyers. This study is meant for all those stakeholders who are in the business of selling insurance policies, like insurance companies, brokers and agents.

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## Annexure 1

### Model Fit Summary (Modified Model)

Achieved minimum

Chi-square is 40.576

The degree of freedom is 30

Level of probability is 0.094

### Minimum Discrepancy of Confirmatory Factor Analysis

Model	No. of Parameters	Minimum Discrepancy	Degrees of Freedom	Probability	Minimum Discrepancy/ Degrees of Freedom
Default model	25	40.576	30	.094	1.353
Saturated model	55	.000	0		
Independence model	10	564.277	45	.000	12.539

### The Goodness of Fit Index

Model	Root Mean Square Residual	The Goodness of Fit Index	Adjusted Goodness of Fit Index	Parsimony Goodness of Fit Index
Default model	.068	.962	.930	.525
Saturated model	.000	1.000		
Independence model	.312	.588	.497	.481

### Baseline Comparisons

Model	Normed Fit Index Delta1	Relative Fit Index rho1	Incremental Fit Index Delta2	Trucker-Lewis Index rho2	Comparative Fitr Index
Default model	.928	.892	.980	.969	.980
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

### Parsimony-Adjusted Measures

Model	P-RATIO	Parsimony Normed Fit Index	Parsimony Comparative Fit Index
Default model	.667	.619	.653
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

### Root Mean Square Error of Approximation

Model	Root Mean Square Error of Approximation	LO 90	HI 90	P-CLOSE
Default model	.043	.000	.073	.617
Independence model	.244	.226	.262	.000

### Annexure 2

#### Standardized Regression Weights (SRW) & Squared Multiple Correlation (SMC)

Observed	Variables	Estimate (SRW)	Estimate (SMC)
APD <---	F1	0.745	0.555
AOD <---	F1	0.811	0.657
AP <---	F1	0.722	0.520
EB <---	F2	0.796	0.624
SF <---	F2	0.872	0.724
HSE <---	F3	0.653	0.433
HRE <---	F3	0.639	0.417
BR <---	F3	0.569	0.325
BI <---	F4	0.704	0.481
IA <---	F4	0.639	0.384

