

Planning Ahead: Advanced Prediction of Car User's Intention to Use the Future Railway system in Libya

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ABSTRACT

This study was conducted to examine the car users' willingness to take new railway system for intercity travel in Libya to reduce car accident on intercity highways. This study introduced three novel constructs; namely novelty seeking (NS), trust (TR), and external influence (EI) (mass media campaign) into the theory of planned behaviour (TPB). A total of 338 respondents from five major cities in Libya (Benghazi, Tripoli, Misrath, Tobruk and Surt) were participates in this study. The findings revealed that the attitude (AT: 0.236***) toward new railway system, subjective norms (SN: 0.062), and perceived behaviour control (PBC: 0.149**) is directly and positively affect the behaviour intention of car users in Libya to take new railway system for intercity travel. Furthermore, the novelty seeking (NS: 0.131*) shows indirect and positive relationship between behaviour intentions via attitude. Trust (and external influence were found to have a positive effect towards three behaviour intention to take railway system's antecedents (T-AT: 0.551***, T-SN: 0.387*** and T-PBC: 0.376***). However, not limited to these three antecedents, external influence also reported the direct and positive influence on the trust and novelty seeking. Ultimately, the theoretical and marketing implications of the transportation arena were derived. This study was considered as a hint to new railway system authorities in Libya to arrange the strategy to attract the car users to choose new railway system as travel alternative for intercity travel.

التخطيط المستقبلي: التنبؤ المتقدم لنية مستخدمي السيارة في ليبيا لاستخدام نظام السكك الحديدية الجديدة في المستقبل

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الكلمات المفتاحية:

نظرية السلوك المخطط
السكك الحديدية الجديدة
نموذج المعادلة الهيكلية
النية السلوكية
البحث عن التجديد
الثقة
وسائل الإعلام
النقل في ليبيا

الملخص

أجريت هذه الدراسة لفحص مدى استعداد و رغبة مستخدمي السيارات في استخدام نظام سكك حديدية جديد للسفر بين المدن في ليبيا لتقليل حوادث السيارات على الطرق السريعة بين المدن. قدمت هذه الدراسة ثلاثة بنيات جديدة: وهي البحث عن التجديد أو استخدام ما هو جديد (NS)، والثقة (TR)، والتأثير الخارجي (EI) (حملة وسائل الإعلام) في نظرية السلوك المخطط (TPB). شارك 338 مستجيباً من خمس مدن رئيسية في ليبيا (بنغازي وطرابلس ومصرات وطبرق وسرت) في هذه الدراسة. كشفت النتائج أن الموقف (AT: 0.236***) تجاه نظام السكك الحديدية الجديد، والمعايير الذاتية (SN: 0.062)، والتحكم في السلوك المتصور (PBC: 0.131*) يؤثر بشكل مباشر وإيجابي على النية السلوكية لمستخدمي السيارات في ليبيا لاتخاذ نظام السكك الحديدية الجديد للسفر بين المدن. علاوة على ذلك، يُظهر البحث عن التجديد أو استخدام ما هو جديد علاقة غير مباشرة

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وإيجابية بين نوايا السلوك عبر الموقف. تم العثور على الثقة والتأثير الخارجي ليكون لهما تأثير إيجابي تجاه نية السلوك الثلاثة لأخذ سوابق نظام السكك الحديدية (T-AT: 0.551***, T-SN: 0.387*** and T-PBC: 0.376***). ومع ذلك ، لا يقتصر التأثير الخارجي على هذه السوابق الثلاثة ، فقد أبلغ أيضاً عن التأثير المباشر والإيجابي على الثقة و استخدام ماهو جديد. في نهاية المطاف ، تم اشتقاق الآثار النظرية والتسويقية لساحة النقل. تم اعتبار هذه الدراسة بمثابة تلميح لهيئة وجهاز السكك الحديدية الجديدة في ليبيا لترتيب إستراتيجية لجذب مستخدمي السيارات لاختيار نظام سكك حديدية جديد كبديل سفر للسفر بين المدن.

1. Introduction

Due to the prospective of addressing intercity transport problems, management of travel demand has got huge attention in a number of countries, including Libya. The strategy of managing intercity travel demand not just features organizing the transport system, but also relates to the issues related to the use of vehicles, such as, traffic blockage, accidents, and pollution.

In countries or regions with an extensive land area, such as Libya, the need to make long-distance travel, also known as intercity travel, is markedly higher. This phenomenon has been observed in other countries, such as the United States (US) and Europe [1], China [2]. There are two options for connecting cities in Libya: by land (intercity bus or private vehicles) and by air transportation. In case, the government has been consistently trying to improve intercity transport, by means of several strategies, consequently, it essential to explore the improvements of road, railway and air transport in Libya. Therefore, Libyan Ministry of Transport has conducted several studies to improve intercity transport and to study behaviour of intercity mode choice using logit model for the existing land transport (intercity bus or private vehicles) and air transportation [3-13].

Borhan et al. [11] have pointed out that intercity travel in Libya is mainly made using private vehicles, especially cars. This is similar to other countries, such as the US and Europe, where people are willing to drive for intercity travel instead of relying on either land or air based public transport [14]. People who depend on private cars for intercity travel are exposed to risk of traffic accident while making the journey. The Libyan news agency, LANA, reported that almost 2000 people have been killed in an equal number of traffic accidents from January to November 2012; this makes the roads in Libya the most unsafe road network on earth. According to the World Health Organization [15] the rate of road traffic fatality in Libya is 49.6 death per 100,000 populations in contrast to 12.3 in the US, 6.9 in France, (8.7 in Italy, 3.6 in the UK, and 3.9 in Japan; this means that the deaths caused by road traffic accidents in Libya is higher than in any other country.

In 2000, the previous Libyan government has allocated \$11 billion to deal with these issues and to improve the public transport infrastructure, including road, rail and air transportation [9-13]. A portion of the allocated budget is used to construct a double track railway along the coastline which passes through all major residential area and along the Mediterranean coast between Libya's border with Tunisia and Egypt. This is considered as a good investment for improving intercity travel since, according to [16], the train is the most ideal mode of transportation for a resource-efficient, fast and safe mobility for high demand intercity travel. [2] Asserted that HSRs have economic and technical advantages in terms of speed, capacity, safety, eco-friendliness, convenience and energy conversion, especially in large countries such as China and Libya. This mode of transportation has been widely used in many countries for intercity travel, for instance in the US [16], China [2], Europe [1], Turkey [17] and Taiwan [18].

In this regard, the most critical elements in planning and developing a new transportation system is identifying a transportation system that fulfills travel demand, such as better travel condition, convincing travellers to change their mode of travel, and constructing new travel routes. The train is a new investment for intercity travel in Libya. As pointed out by Sperry et al. [16], it is difficult to predict the potential ridership and mode shift. Thus, this study is carried out to investigate the behaviour intention of Libyan car drivers to use new train for intercity travel by expanding the Theory of Planned Behaviour (TPB) with three new constructs, namely, novelty seeking, trust and external influence.

Rail Transport in Libya

Basically, trains are the most useful form of transport, as it needs less energy per ton of goods or per passenger. Rail transport has been acknowledged as one of the most effective land transport, because of the very simple operation and affordability to carry massive volume goods over long distances, apart from passenger safety, high speed, and cleaner environment.

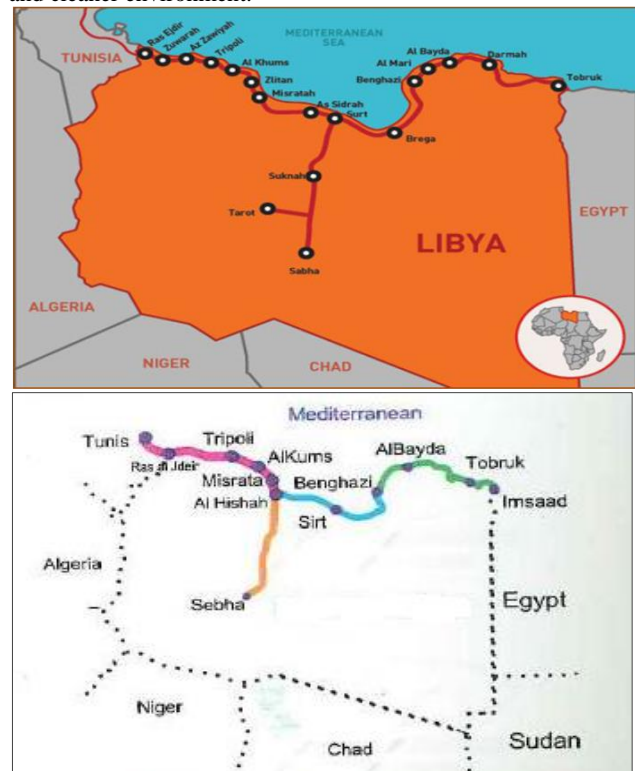


Fig 1. The New Railway Network Map in Libya

Nevertheless, railways were abandoned in Libya since 1965, for repairing the established occupation. The short railway line in Libya was first introduced in 1901. Currently, Libya is constructing the most significant railway project in North Africa, which covers 3170 kilo meters and 75 stations, including 18 major junctions (see Figure 1), and 168 bridges. As illustrated in the figure, the first axis indicates 2178 km, which connects Libya with other countries, such as, Tunisia in the west and Egypt in the east, and crosses all residential areas and coastal cities in Libya. The coastline is double-track high-speed railway line, laid beside the Mediterranean coast between the Tunisian and Egyptian border. The second axis encompasses 992 KM, which links the northern Libya (Surt City) with other cities in the centre, and continues to south-west Libya (Sabha City). This project was initiated in 1992, and was supposed to be finished in the end of 2015. Figure 1 shows Libyan railway network map.

I. The Theory of Planned Behavior (TPB)

The theory of planned behaviour (TPB) is an expansion of the theory of reasoned action (TRA) [19, 20, and 21]. According to the theory of planned behaviour, attitudes of individuals towards the behaviour, their subjective standard, and their perceived behavioural control, indirectly ascertain their behaviour by means of their

intentions [21].

A significant factor of TPB is the concept, where, intention conciliates attitude and behaviour, and that intention more precisely forecasts behaviour as opposed to attitude [22]. Consequently, TPB proposes three hypothetically independent determinants of intention. Attitude towards behaviour is a positive or negative emotion to perform behaviour (to do or not do something) [23, 24]. Attitude is a psychological construct. In the case of transportation, attitudes can be summarized as a traveller's excitement towards a particular travel mode, such as car and new train. In implementing TPB for travel mode choice, attitude is assessed as a fundamental factor for beneficial and undesirable or satisfying and distressing feelings. Subjective norm is an indication of perceived social pressure where important people (parents, wife/husband, and associates) motivate an individual to accomplish or deny behaviour. Any individual or team acting as a reference group could have a strong influence on the opinions, behaviour, and decisions of others since a person might comply with their reference groups [25]. Perceived behavioural control is another factor of intention, and it demonstrates the experiences, expected challenges, and resources (such as, chance, time, revenue, and expertise) of a person that are vital for accomplishing a behaviour [23; 25]. Generally, a person has a higher perceived behavioural control if they believed that they have more resources and opportunities and less hurdles [25]. Behavioural intention is the subjective possibility that an individual might indulge in a given behaviour. According to TPB, the intention of an individual to perform or not perform behaviour is the immediate determinant of the behaviour [22]. Thus, we postulate the following hypotheses.

H₁. Attitude has a positive effect on a car user's intention to take the new train.

H₂. Subjective norm has a positive effect on a car user's intention to take the new train.

H₃. Perceived behavioural control has a positive effect on a car user's intention to take the new train.

In the literature novelty seeking is often referred to as motivation. [26] Proposed that novelty seeking is a curiosity drive that counters the desire for familiarity. A number of studies have proposed that, novelty seeking impacts attitude towards new technology [26; 27]. Thus, this study has formulated following hypotheses:

H₄. Novelty seeking has a positive effect on car user's attitude to take the new train.

Furthermore, Trust is considered as an important element of any relationship. Many studies have reported the positive effect of trust on customers or users' attitude. A recent study by [11] found that trust has a positive and indirect effect on user's willingness to take low cost airlines for intercity travel in Libya through attitude, subjective norm and perceived behavioural control. Based on the information obtained from relevant literature, the following hypotheses are proposed.

H₅. Trust has a positive effect on a car user's attitude to take the new train.

H₆. Trust has a positive effect on subjective norm to take the new train.

H₇. Trust has a positive effect on perceived behavioural control to take the new train.

Finally, the findings of several studies suggested that there is strong relationship between mass media campaigns and a person's attitude (for example 11; 25, 26). For example, a recent study by [11] has established that mass media campaigns, such as social media, radio, newspaper, television, etc, have a direct effect on user's attitude and an indirect effect on behaviour intention to use the low-cost airlines in Libya.

H₈. External influence has a positive effect on one's attitudes to take the new train.

H₉. External influence has a positive effect on one's subjective norms to take the new train.

H₁₀. External influence has a positive effect on one's perceived behavioural control to take the new train.

H₁₁. External influence has a positive effect on one's novelty seeking to take the new train.

H₁₂. External influence has a positive effect on one's trust to take the

new train.

II. Research Methodology

The present study explores the relationship between trust, novelty seeking, external influence and the determinants of TPB (e.g. attitude, subjective norms, perceived behaviour control and behaviour intention) in predicting Libyan car driver's intention to take the new train in Libya for intercity travel. The questionnaire was design for collecting data to test the validity of the research hypotheses and model. All items in the questionnaire were obtained from relevant literature and have been modified to fit the context of social, economic and cultural conditions in Libya. A total of 338 respondents were questioned over three months, by means of a survey conducted in the year 2015. Pilot study is the only approach that guarantees the usefulness of the questionnaire; we had conducted a pilot study was carried out preceding the actual data collection. The pilot study was intended to analyse items employed in the questionnaire. All items were measured using fully anchored, seven point Likert scales was used as measurement scale of questionnaire with 1="strongly disagree" and 7="strongly agree".

Face-to-face approach and self-administered questionnaire was distributed to respondents using cars for intercity trips, such as, working, studying, recreational and social, etc. Then, the data was analyzed using the Statistical Package for Social Sciences Software (SPSS) version 21 and Analysis of Moment Structure (AMOS) version 21.

III. Results and Discussion

A. Procedure and Participants

The respondents (car users) were randomly selected from some Libyan coastal cities. The survey was developed, using existing scales and administered to the car users. All the selected 338 car drivers were invited to participate in the survey; of which, 58.9% were males (199 respondents); whereas 41.1% females have answered the survey (139 respondents). In terms of age, the respondents range from below 20 years old to above 60 years old. The majority of respondents 42.3% were in the age group of 21-30 years old, 30.5% were in the age group of 31-40 years old and 17.2% were in the age group of 41-50 years old. 6.8% of the respondents were in the age group of 51-60 years. On the other hand, the levels of education were categorized as primary school, Intermediate/secondary school, and university degree. The vast majority of respondents have college education. Individuals in this category were 213 persons, constituting 63.0% of the study sample. Lastly, people having secondary level of education are 106 persons, comprising about 31.4% of all respondents. With respect to respondent's occupation, majority of the respondents which were 248 persons (73.4%) were employed, where 10 respondents (3.0%) were private company employees and 36 respondents (10.7%) were private business. Among the examined income brackets, most of the respondents (employees) earned about 300 to 700 LyD (Libyan Dinar) per month in 2015. The highest percentage of travellers (31.1%) had a monthly income of 400- 500 LyD. Furthermore, 13.3% (45 respondents) had income between 300 and 400 LyD, 27.2% (92 respondents) had income between 500 - 600 LyD, 15.4% (52 respondents) had income between 600 and 700 LyD, and 6.2% (21 respondents) had income more than 700 LyD.

B. Scale Validation and Measurement Model

Based on recommended two-stage analytical processes [28], confirmatory factor analysis (CFA) using AMOS 21 was performed for evaluating the consistency and credibility of the measures, and then the structural relationships were evaluated. The fit criteria of overall model were examined to ensure that the empirical data and the hypotheses are acceptable. The ratio of chi-square to degree of freedom (χ^2/df) is 2.654 (less than 3.0), which indicate that the measurement model is sufficiently fit based on the recommendations made by [29, 30]. In addition, the values for Goodness of Fit Index

(GFI), Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI), Tucker-Lewis coefficient (TLI) and Comparative Fit Index (CFI) are 0.984, 0.921, 0.980, 0.952, and 0.984, respectively. [30] Stated that the acceptable fit value for GFI, AGFI, NFI, TLI and CFI is equal to or greater than 0.90. The Root Mean Square Error of Approximation (RMSEA) in this study is less than 0.10 (0.07); this indicates that the fit is acceptable. [30] noted that an RMSEA value equal to or less than 0.05 indicates a perfect fit, while an RMSEA value less than 0.10 indicate an acceptable fit, while a value greater than 0.10 indicates a bad fit. The proposed model is deemed to be valid as all the values fit well with the model.

Confirmatory factor analysis (CFA) method was used to assess the validity of the measurement scale for the measurement model; the

AMOS 21 statistical software tool was used for the analysis. Primary goal of CFA is to assess construct validity of the proposed measurement theory. The validity of the scale was measured by two phases: (1) convergent validity: to ensure that, the measurement items or indicator have load factors, in order to indicate that, it converges at one point. High construct validity can be seen from the higher load factor, indicating that the items are concentrated at one point. (2) Discriminant validity: to ensure the uniqueness of every constructs in the model. Generally, the discriminant validity measures the extent to which the constructs differ from each other. Discriminant validity with higher value will prove the uniqueness of construct and can explain the phenomenon being studied.

Table 1. Means, standard deviations, and correlations

Construct	Item loading	Composite Reliability	Factor correlation								
			AVE	AT	SN	PBC	BI	NS	TR	EI	
AT	0.64–0.88	0.98	0.92	-							
SN	0.72–0.75	0.96	0.89	0.89	-						
PBC	0.62–0.83	0.88	0.53	0.52	0.51	-					
BI	0.64–0.82	0.95	0.83	0.53	0.73	0.53	-				
NS	0.65–0.86	0.97	0.89	0.47	0.52	0.45	0.58	-			
TR	0.65–0.77	0.98	0.89	0.68	0.66	0.49	0.66	0.65	-		
EI	0.68–0.84	0.92	0.80	0.39	0.60	0.38	0.64	0.46	0.54	-	

** $P < .01$. Significantly at a level of .01

Not: *New train Attitudes (AT)*, *External influences (EI)*, *Behavior intention (BI)*, *Novelty Seeking (NS)*, *Perceived behavior controls (PBC)*, *Subjective Norms (SN)*, *Trust (TR)* Convergent validity has been assured by means of assessing composite reliability (CR) and average variance extracted (AVE) from the measures [29]. As shown in Table 1, our composite reliabilities (CR), ranging from 0.852 to 0.988, have exceed the recommend threshold of 0.50 [30]. Furthermore, the average variances extracted (AVE) range from 0.53 to 0.92, which are also above the acceptable value of 0.50. This shows the results of root-squared AVE high value compared to the correlation between the constructs, and then discriminant validity has fit its conditions. Thus, all the variables in our model are viewed as distinct but correlated factors. In order to examine the relationships between independent variables and dependent variable, a further examination of hypotheses testing is needed. Table 1 shows the means, standard deviations, and inter-correlations for all variables. The results demonstrated a significant positive correlation among behavioral intention.

C. Structural Model and Hypothesis Testing

In this study, TPB models were employed to examine the relationship of constructs variables with exogenous and endogenous (intention behaviour) variables. The structured equation modelling was used to analyse the formal structure of the proposed model. The analysis included path coefficient, path significant, and the constructs’ variance, explained by the R-square; the figure 3 illustrates the results of the analysis. By using a measurement model that has met the assessment, a complete structural model was developed to test the relationships among the constructs, as suggested in the theoretical model in this study. Decision analysis of the complete structure of the model in terms of using new train is illustrated in figure 2. AMOS 21.0 software was used to assess the suitability of the model and interest hypothesis route. The results show that most of goodness-of-fit indices are above the acceptable levels, ($\chi^2/df = 2.923$; RMSEA = 0.077; NFI = 0.991; CFI = 0.994; GFI = 0.991; AGFI = 0.921; TLI = 0.957), the TPB model results show excellent fit values in all the indices for predicting car drivers’ intention to use new train in Libya. Therefore, our proposed model shows excelente fit to the data and provides more information than other alternative models do.

Table 2, presents the parameter estimates obtained using SEM. The results of the t-test show that, with the exception of hypothesis 2 (H2), all hypotheses are supported by the data. Therefore, the research hypotheses formulated in the present study assume that attitude (H1) and perceived behaviour control (PBC) (H3) have a

direct and positive influence on behaviour intention; novelty seeking has a direct and positive association with attitude (H4); trust has a direct and positive relationship with attitude (H5), subjective norms (H6) and PBC (H7); and external influence has a direct and positive relationship with attitude (H8), subjective norms (H9), PBC (H10), novelty seeking (H11) and trust (H12). Subjective norm is predicted to have no significant relationship with behaviour intention (H3). A summary of the hypothesis testing model is given in Table 2.

In addition, this study assesses the indirect effect of external influence, trust and novelty seeking on behaviour intention. The indirect effect of external influence on behaviour intention is 0.016 ($0.516*0.131*0.236$) and 0.034 ($0.606*0.376*0.149$) via ‘novelty seeking + attitude’ and ‘trust + perceived behavioural control’. The indirect effect of external influence on behavioural intention that occurs via three antecedents of intention is 0.136 ($0.310*0.236 + 0.438*0.062 + 0.240*0.149$). On the other hand, novelty seeking has an indirect effect on behaviour intention with 0.031 ($0.131*0.236$) via attitude and 0.210 for trust on behaviour intention via three antecedents of behaviour intention.

The present study has found that the proposed model accounts for novelty seeking, trust, attitude, subjective norms, and perceived behavioural control by 27%, 37%, 36%, 55% and 31%, respectively. Thus, these variables contributed to the 62% of the variance explained for the case of behavioural intention. Based on standardized path coefficient, most paths are significant and are directed in the predicted direction (see Table 3). Hypothesis 1 ($\beta = 0.149, p < 0.01$) and Hypothesis 3 ($\beta = 0.236; p < 0.001$) is supported; this means that attitude and PCB positively influence Libyan car drivers to take new train for intercity travel in the future. On the contrary, the effect of subjective norms on behaviour intention (Hypothesis 2) is not supported. This finding is consistent by that made by [11-12], where attitude and PBC were found to have strong influence on user’s behaviour intention to take LCC in Libya. [31] Have pointed out that behaviour intention is mainly connected with attitude towards recreation activities and is the least influenced by subjective norms. Many researchers have agreed that the subjective norms construct contributes the least to their TPB model [e.g. 11, 32, 33, and 34]. Other evidence for this is provided by the findings made by [35] who studied the intention to not depend on private cars in Victoria, Canada and Giessen, Germany, respectively. These studies found that the attitude construct exerts the strongest influence in reducing dependence on private cars while a subjective norm has the least or no influence.

Table 2. Summary of Hypothesis Testing Model on New Railway in Libya

Variables			B		Hypothesis
Attitude	towards	Behaviour intention	0.236***	H1	supported
Subjective norms	towards	Behaviour intention	0.062	H2	Not supported
PBC	towards	Behaviour intention	0.149**	H3	supported
Novelty seeking	towards	Attitude	0.131*	H4	supported
Trust	towards	Attitude	0.551***	H5	supported
Trust	towards	Subjective norms	0.387***	H6	supported
Trust	towards	PBC	0.376***	H7	supported
External influence	on	Attitude	0.310***	H8	supported
External influence	on	Subjective norms	0.438***	H9	supported
External influence	on	PBC	0.240***	H10	supported
External influence	on	Novelty seeking	0.516***	H11	supported
External influence	on	Trust	0.606***	H12	supported

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

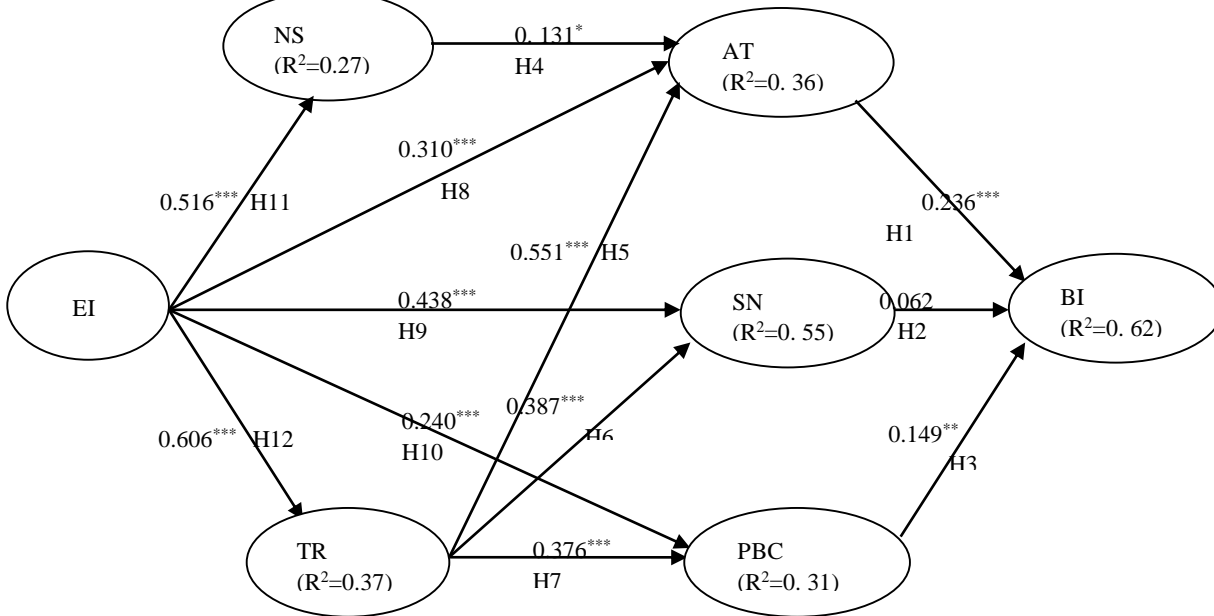


Fig. 2. Graphical representation of TPB model for predicting car drivers’ intention to use new train in Libya

Hypothesis 4 states that novelty seeking ($\beta = 0.131, p < 0.001$) has a positive and direct relationship with behaviour intention to take the new train in Libya. Previous studies have shown that novelty seeking has a strong influence on attitude as well as behaviour intention of travellers [33]. Trust is another major construct that has a positive and indirect influence on behaviour intention via attitude, subjective norms and PBC. As shown in Table 2, Hypothesis 5 ($\beta = 0.551, p < 0.001$) states that trust has a strong influence on attitude. Similar outcomes which support the findings of this study have been reported by [11-12, 25]. Hypothesis 6 ($\beta = 0.387, p < 0.001$) and Hypothesis 7 ($\beta = 0.376, p < 0.001$) are supported in this study and show that there is a direct and positive effect on subjective norms and perceived behaviour control, respectively. The results for Hypothesis 8 ($\beta = 0.310, p < 0.001$), Hypothesis 9 ($\beta = 0.438, p < 0.001$), and Hypothesis 10 ($\beta = 0.240, p < 0.001$) show that there is a significant positive and direct interconnection between external influence (mass media campaigns) and the attitude to take new train, subjective norms and PBC. The results for Hypothesis 11 ($\beta = 0.516, p < 0.001$) and Hypothesis 12 ($\beta = 0.606, p < 0.001$) are supported in this study. This shows that mass media campaigns have a positive relationship with novelty seeking and trust. According to [36- 44], mass media campaign play an important role in providing a better understanding of the delivered message, thereby enhancing trust in the product or service[11-12].

IV. Conclusion

This study aims to investigate the interconnection between the factors affecting the behavioural intention to take new train system in Libya for intercity travel. The reviewed literature indicated that the numerous studies related to the behaviour intention to take several

modes of transportations using SEM. However, there is limited number of study considered the trust, novelty seeking and external influence such as mass media campaign in the extension of TPB. Additionally, this is the very first study related to the intention to take new train for intercity travel in Libya. The important of this study is to expose the relationship several constructs to the behaviour intention of car drivers in Libya to take new train. Thus, this study will shed light on what new train operators need to do to enhance the intention of the car drivers to use new train in Libya instead of private car for intercity travel.

This study aimed to quantitatively investigate that how the introduction of new rail system in the future influences intercity traveller’s choice behaviour. Therefore, a modified version of the theory of planned behaviour was used in order to explain and predict car users’ transportation mode choices. In other words, applying theory of planned behaviour (TPB) to understand travellers’ willingness to take new kind of transportation in Libya such as, train system. In order to understand travellers’ willingness to take new train and its antecedents, structural equation model (SEM) models was developed. In the process of developing the SEM model in this study, two methods approach (measurement model and structural model) is used to assess the construct validity, the appropriateness of the model and to test the hypothesis. In both models, structural equation models analysis showed that car users’ transportation mode choices were moderately well predicted by the theory of planned behaviour, and that some variables added to the original theory explained variance over and above the original constructs in the theory. The addition of the predictor constructs the TPB was found to have increased explanatory power of the model. The addition of constructs predictor for increased explanatory power model that has

been done. In this study, by adopting and extending the theory of planned behaviour of Ajzen [24] the major factors in affecting the intercity travel mode choice were highlighted. The TPB models for new high speed rail and low cost airline were well supported and most of hypotheses are confirmed.

- Based on the high load factor results in the CFA and as for the behavioural intention, it was found that all the variables were able to account for 62% of the variance explained for new rail. Therefore, the Libyan Railway Corporation can attract car users. The train is a new kind of transportation vehicle in Libya and most of car users in Libya looking for new novelty seeking to seek out new stimuli, new experiences, and novel products. Therefore, effective promotions and advertisement about new stimuli and novel experiences of trips by new train could enhance appraisal towards new train, resulting in a stronger willingness to take it.
- Based on result, the attitude toward new kind of transport in Libya (i.e. new train attitude), novelty seeking and trust were highly significant at ($p < 0.001$) level and have directly affected on the behavioural intention to use new train. Moreover, the external influence (i.e. advertising campaigns by media, documentary reports, and popular press) was also highly significant at ($p < 0.001$) level and affected the behavioural intention indirectly.
- Novelty seeking and trust have highly significant direct effects on car users' behaviour intention to take new rail, the individual' trust have greater impact on car users' intention. Furthermore, trust also impact car users' intention to take new rail indirectly via three antecedents of behaviour intention new train attitude, subjective norms and perceived behavioural control, respectively. The results manifest that a favorable trust towards new train has a decisive influence on the behavioural intention among all factors. Therefore, the Libyan railway corporations can entice car users by improving their positive image. In the model, the effect of new transport modes attitude (i.e. new train attitude) on intention are very strong only less than trust. Therefore, acceptable fare and convenient access to tourist attractions are advised to further enhance the ability to take new train. Furthermore, subjective norm has the least effect on intention as many researches asserted [18, 34].
- According to the high Load factor results in the CFA analysis and as for the behavioural intention, all the variables are able to account for 62% of the variance explained for new rail. The present study also finds that the proposed for new train model accounts for 27% of novelty seeking, 37%, 55% in subjective norm, and 31% in perceived behavioural control.
- Meanwhile, the SEM model has fulfilled the suitability index values of model such as GFI, AGFI, NFI, TLI, CFI and also the average range, RMSEA. The modifier entered into the TPB extension, which are the trust, novelty seeking and external influences give a significant relationship towards intent to use the new kind of transportation in Libya such as, train. By including the trust, novelty seeking and external influences variables to TPB make a better fit into the model. In other words, the extension of TPB by trust (TR), novelty seeking (NS) and external influences (EI) allows deduction of more differentiated intervention strategies.

V. Limitations and further directions of the study

There are several limitations to this study with respect to the constructs and model used. By taking these limitations into account, future researches could use an alternative model to gain a greater understanding of the overall intercity travel mode choice in Libya. Future research could examine the impact of past behaviour on the relationship between the antecedents and other consequences, such as loyalty. Another personal characteristic should be examined for moderating effect. There is a need to carry out a research regarding the image of new Libyan train system and behaviour issues such as travel motivation, attitude of travellers towards service quality, and fulfilment. Future studies could also examine other psychological factors, such as moral responsibility, understanding repercussions, socio-economic variables and travel characteristics, in order to better comprehend the behaviour intention of Libyans towards future use of new train. One of the limitations in this study is the RMSEA value of 0.07 for the overall model for predicting the intention of Libyan car drivers to take the new train since this value exceeds the perfect fit

cut-off value (0.05). Another limitation of the current study is that the utilization of a convenient sample of car drivers and the sample size is not sufficient to represent the Libyan population. Thus, further multiple random samples with a bigger sample size could help to generalize the results and improve their accuracy. In terms of policy, it is especially crucial to improve the perceived possibilities for reducing car use in an attempt to motivate commuters to use rail transportation. Furthermore, policies aimed at minimizing the use of cars for commuting should also emphasize on moral responsibility (e.g. personal norms) in order to have an impact.

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