International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

How logical are your decisions?

Hoang Hue Chi
DBA Program 2019-2020, Rennes School of Business, Rennes, France
Faculty of English for Special Purposes, Foreign Trade University, Hanoi, Vietnam

Abstract— *We make decisions everyday, some are just everyday while some are strategic. Amidst the Covid-19 spread, an example is a stay-home decision, some have their own versions of the name Covid-19 in their native language expressing a relaxing attitude while many have a more experienced view, and they even stay home before any official restrictions. What is worth noticing is that was at first, then the government weigh in, a vast majority decide to stay home. So whose decisions are more logical? It is politically correct to say that everyone has their own logics. And it is true to say that our decisions are influenced. Considering decision-making as an information processing process at the end of which is a decision made, factors constituting completeness of information integratedly moderate and mediate the relation between multi-institutional logics, categorization and decision making variables. This research, using mixed methods, empirically studies the moderated mediation effect of different moderators and mediators on decision making at individual level. Results confirm significant correlations. How do categorization and institutional logics influence decision-making quality in business activities?*

Keywords— *Communication errors, Cognitive biases, Decision making, Institutional logics, Logics.*

I. Introduction

This piece of writing is one among studies to complete a doctoral thesis on business and management in amalgamation of human-machine intelligence. Taking decision-making as an example, it is among those absorb intelligence the most, and DSS, decision support system, which is an adaptive computer-based system, has been in use for a long time (Goslar and co-authors, 1986). More importantly, in recent years, given the availability of big data and development of AI (Artificial Intelligence) technologies, DSS (Decision support system) does not set itself aside from such enhancement. However, it is still a formidable challenge when decision-makers are asked if they make perfect decisions. This research renders some reasons why decisions are potentially imperfect, e.g. errors, constituting factors, role of technological change and development, social relations at work and such knowledge endorses an optimum configuration. In particular, it affirms the influence of categorization and institutional logics on decision-making quality and the existence and influential role of various mediators, variables causing indirect effect between these main categories, and moderators, variables whose interaction with one of the main categories change the causal effect, both constituting completeness of information such as frequency, effect, channel, load, timing, verification and learning channels. Consistency in decision-making is significantly mediated and moderated. After this introduction, the theorization section brief summarizes the conceptualized relationships between main concepts detailed in one of writer's previous conceptual paper, Hoang, H.C. (2019) Influence of Multiple Institutional Logics and Social Categorization in decision making in business, Proceedings of Researchfora International Conference, ISBN 9789389090383. A theoretical framework and hypotheses are included. Hypothesizing is followed by a methodology section presenting how data was collected and analysed. The later sections are those for results, discussion and conclusions.

II. Theorization and Hypotheses

Main concepts in this research are diversity, institutional logics, social categorization, decision making. Diversity is a collective amount of differences among members with in a social unit (David, A.H. and Hock-Peng S., 2006). Institutional logics is defined as 'the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality' (Thornton & Ocasio, 1999)[1]. Regarding social categorization, according to Knapp and Dalziel (2007) and Hogg (2001), categorization function as a cognitive tool in order to simplify environment as well as accelerate in information processing. Social categorization is considered a cognitive categorization which involves human individuals. Cognitive biases are in place as social categories become salient. Knapp and Dalziel (ibid), refer to various authors' researches to summarize such biases as exaggerated similarities within social groups, exaggerated differences between social groups, and more favorable evaluation of groups of membership. And the concept of decision making is defined as the process of choosing from among several alternatives (Moorhead & Griffin, 2001). In this research, from information processing process perspective, decision-

[1] Institutional logics share common characteristics of what we usually call logics. In common sense it is understood as reasonable thinking. Schneckenberg (2019), with reference to other authors, referred to a definition from the perspective of cognitive and psychological theory that logic is a systematic form of reasoning conducted in accordance with commonly accepted principles of validity. Mutch (2018) referred to the concept of logic as a set of interconnected relations conditioning activity. In the same publication, this author makes reference to Prahalad and Bettis's study in organizational strategy in 1986, in which the term dominant logic describes sets of assumptions governing organizational action, based on which organizational actors are provided with a sense of direction and appropriateness. Rozaidy and Siti-Nabiha (2018) mentioned other authors, e.g. Powell's and DiMaggio's emphasis on beliefs system, networks, and social norms, Scott's definition of institutional logics as set of social prescriptions signifying a field's shared agreement on goals to be achieved and how to, and Friedland and Alford who recognize institutional logics as important principles based on which forms and practices have direction, attention has focus, meaning is attached to activities, and goals or values to be pursued are identified.

Hoang Hue Chi, "How logical are your decisions?" *International Research Journal of Advanced Engineering and Science*, Volume 5, Issue 2, pp. 61-89, 2020.

making is viewed as an information processing process at the end of which is a decision made, an ultimate choice which is unlikely to change. Decisions are context-dependent, which stem from the fact that those who involve in the decision-making process form a diverse environment of (1) inconsistencies because of various preferences, multiplicity of well-defined preferences and different ideas from various identities, (2) coalitions and bargaining as a result of potential conflict, (3) power and exchange.

To study decisions and decision making, various theories have been used, including choice theories, system theory and information processing theory. Systems theory (Kast & Rosenzweig, 1972) views organizations as social structures embracing in themselves social psychology, power relations and principles of control. Authors also mention a cooperative system, by Chester Barnard in 1938, of physical, biological, personal and social aspects systematically exist as two or more individuals cooperate for a certain end(s). In the same publication, a publication of Katz Daniel and Robert L. Kahn in 1966 was referred to. These authors claimed that social structures are contrived systems made of men and imperfect. Social systems are the compositions of individuals of a wide range of attitudes, perceptions, beliefs, motivations, regular behavioral patterns and expectations. With regards to information processing theory, as defined by Kiss and S.Barr (2015) information processing (IP) is a process in which individuals and organizations make sense of their environment(s) in order to operate effectively within them. Daft and Weick (1984) identify three basic phases, which includes noticing, interpretation, and action. Superiority in information processing capabilities is associated with complexity of belief structures (Dollinger, 1984 and Levy, 2005). Shared meanings, frame construction, socialization processes, roles, contingencies such as power, type of organization, age heterogeneity of team members, and tenure heterogeneity must be taken into deliberation (Daft & Weick, 1984). Corner, Kinicki and Keats (1994) recognize that there are multiple possibilities of bias in choices influencing information gathering and alternative generation can be bettered. In respect of choice theories, while rational choice theory has its limitations such as inadequate attention to society context, loose cognitive and psychological assumptions, e.g. it assumes complete information or great degree of calculation capabilities, no innovative and creative capabilities, and the lack of moral dimension, Burns and Roszkowska (2016) acknowledge the dominance of Rational Choice Theory (RCT) in the conceptualization of human action in social sciences. In decision-making in particular, decision-makers by considering weighted alternatives and their accompanying consequences to choose an optimal choice among available alternatives. Bill Wooldridge and Birton Cowden (2020) when discussing bounded rationality referred to authors, including Cyert and March, stating that decision-makers face informational and cognitive limitations, therefore they make acceptable instead of optimal decisions. The adapted and modified RCT, including prospect theory (Kahneman & Tversky, 1979) and norm theory (Kahneman & Miller, 1986), embraces the psychological, social, and material aspects of human choice behavior (ibid.). They take into consideration cognitive limitations of the decision-makers and recognize all those constituting components of institutional logics (Thornton & Ocasio, 1999, 2008 and Pache & Santos, 2013). Furthermore, according to neuroscientists by applying of theories in categorization in research, significant improvements in understanding of decision making can be achieved (Seger & Peterson, 2013).

Propositions

As the decision makers make choices and formulate their actions on the basis of available information, decision making is an information processing process. In addition, because it is context-dependent, in each of the processing phases, institutional logics and categorization exist and have their impact along the process (See Appendix A). Based on the theoretical framework above, it is necessary to take into account the complex, dynamic cultural, institutional and technological context in accompany with psychological and cognitive factors as characteristics of human actors, e.g. Chester Barnard's differentiation between logical processes and non-logical processes, Herbert Simon's model of bounded rationality and Kahneman's and Tversky's concept of heuristics and biases, it is possible to establish the causality between institutional logics as well as categorization and decision making. A cognitive framework doesn't assume either complete information or full knowledge of choice situation, but incomplete information accompanied by cost of acquiring information. According to Seger and Peterson (2013), the higher the level of complexity of a decision is, the more information must be integrated for a course of action. Considering sources of information, social categorization is an important domain, in which the interaction between preexisting knowledge and category learning is a potential source of stereotypes and biases. These researchers also state that categorization theories haven't placed adequate emphasis on factors, e.g. perceptual information processing, value and selection of response. Communication errors, in this thesis proposal, refer to cognitive errors occurring in the person(s)-person(s) exchange, which affect decision-making as an information processing process. When individuals interact with each other, in decision-making in particular, their human choice behaviors expose the process to cognitive errors in forms of biases, stereotypes, unsolved conflict caused by the spontaneous presence of social categorization and institutional logics. These limitations affects outcomes of the process measured in several dimensions, including efficiency (Stumpf, Zand & Freedman, 1979). Accordingly, it can be proposed that institutional logics and social categorization have an impact on decision making (See Appendix A). This causal relation is further supported by findings in a focus group study conducted in 2019 (See Appendix B). Author posit Proposition 1: In the context of diversity, institutional logics influence decision making. Proposition 2: In the context of diversity, social categorization influences decision making.

Decisions, from information processing perspective, have inherent multiple biases as a result from how the information processing functions. In answering the research question, In

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

the context of diversity, how do categorization and institutional logics take effect on decisions?, given the possible causal relations between institutional logics as well as categorization and decision-making and their possible effect on decision making as an information processing process, it is possible to hypothesize as follow

Do or do not?

Hypothesis: Humans' social properties, institutional logics embedded in actors participating in the decision-making process as well as the social categorization among themselves, influence decision-making in business activities.

How?

(1) Moderation: Under the condition of existence of cognitive errors (W), social properties of actors (x) lead to decision-making qualities (y).

(2) Mediation: Social properties (x) predict occurrence of cognitive errors (M), which in turn predicts decision-making qualities (y).

III. Methodology

A. *Operationalization: Concepts, constructs and measures*

Concepts such as diversity, institutional logics, social categorization, decision making are defined as the previous section of main concepts section of theoretical framework. Constructs and measures are decision made, decision change, decision time as dependent variables, institutional logics as independent variables, mediator(s) is completeness of information (as representation of cognitive errors, information-oriented biases) and moderator(s) is completeness of information (as representation of cognitive errors, such as social categorization). Control variables are experience, gender, year of birth. In particular, to answer the research question - In the context of diversity, how do categorization and institutional logics take effect on decisions? Model specifications are as follow

Dependent variables: (1) Decision (Yes, No, or Undecided, Norminal - categorical), (2) Decision change (Yes or No, Binary), (3) Change in length of decision time (More, Less or Unchanged, Nominal - categorical)

Independent variables: (1) Specific institutional logics (Scales, Ordered - categorical), (2) Social categorization variables (used as criteria for grouping), e.g. Learning channels (Visual, Auditory, Haptic, Nomial - categorical)

Integrated moderation and mediation effects: Completeness of information (Interaction terms), (1) Frequency of use by information types, i.e forms, format (Scales, Ordered - categorical), (2) Effect of use by information types, i.e forms, format, by information characteristics - Positive(Scales, Ordered - categorical), Effect of use by information types, i.e forms, format, by information characteristics - Negative(Scales, Ordered - categorical), (3) Timing of availability (Scales, Ordered - categorical), (4) Load of information (High, Low at time of availability and Scales, Ordered - categorical), (5) Information channels by information characteristics - Positive(Scales, Ordered - categorical), Information channels by information characteristics - Negative(Scales, Ordered - categorical), (6) Verification (Yes or No, dichotomous), (7) Learning channels variables (Scales, Ordered - categorical) and (8) Preferred learning styles variables (Yes or No, Binary and Scales, Ordered – categorical).

Control variables: Experience (Years, count), Year of birth (Year, countinous)

Dummy variables: Gender (Female, Male, Binary)

B. *Data Collection*

Sampling methods: Cluster sampling

The population are students at Foreign Trade University, Hanoi Campus. Institutional logics and social categorization are established through education and other social interactions. Main subjects, as a state university in Vietnam and specialized in trade as in this its name, covering all these logics from politics to micro transactions. This population is accessible through professional contacts, and has a good possibility to collect longitudinal data, from freshmen till alumni. It is possible to benchmark on the dimension of the academic business education against the on-service business characteristics. Sample size, for 5% margin of error on a population of around 15000 individuals, calculated following formula by Saunders, Lewis and Thornhill (2016) is approximately at least 400 respondents.

Sampling frame is class lists in ETCs system, clusters are naturally formed as students registered for classes, cluster grouping by classes per year of education, e.g Year 1 - Year 4. Clusters are numbered, unique number each, as in ETCs system. Sample clusters are selected by random sampling. The sampling frame is scattered in academic timetable for each year, into numbered classrooms with class name lists, in each classroom there is potential cluster sample identified by a unique number - class, year, subject - assigned by the training department. One classroom equals a class on the list. A few clusters are selected by randomly drawing from room numbers. N.B: Year 1 are on 1st floor, a certain time in a certain day in the week, and the same applied for other years. Questionnaires are then delivered to each member of the selected class in the selected classroom.

Surveys are conducted following best practices published by BECA, USA. The questionnaire is designed having taken into consideration issues in design discussed by Lietz (2010), to collect data for variables specified, e.g. learning channels and styles to understand how people learn, i.e. how they acquire knowledge and capabilities and develop motivations matters so as to identify differences which influence their information processing process. After a pilot and a focus group conducted respectively in November 2018 and September 2019, the adjusted questionnaire (See Appendix C) is structured in 4 sections, one for demographic data (open questions), one for the presence of institutional logics (Likert Scales, with defined concepts), and one for learning channels (questionnaire produced by Lynn O'Brien in 1985) and styles, adjusted from Kolb's (Closed Yes/No question for preferences and for behavioral patterns are Likert scale frequency questions (Chang & Krosnick, 2003; Atsushi & Osamu, 2010;

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

Brown, 2010; Lietz, 2010), one for decision (Yes or No, supported by Likert Scales for institutional logics leading to the decision) and one for mediation effects (Likert scales[2]). Cronbach's alpha are from 0.74 to 0.91 and factor analysis shows above average relevance of the variables.

C. Data Analysis

SEM structural equation models (SEM and GSEM) on data collected confirm what is hypothesized, an integrated moderation and mediation model, which is supported by a focus group study assignment. Many in (G)SEM models for integrated moderation and mediation effects have correlations p-values and model fit of at least .05. Power of results are not interpreted only on p-values, but also in balance between statistical significance and practical meaning. In particular, in GSEMs logits are used, ordered logit for mediators (Likert scales, load, channel, effect, timing of information are on 5 scales - 1 Not at all, 2 A little, 3 Moderately, 4 Significant, 5 Turn-around and frequency is on 5 scales of 1 Rarely, 2 Occasionally, 3 Sometimes, 4 Usually and 5 Always), multinomial logit for decisions (1 Undecided, 2 Yes and 3 No) and change in decision time (1 Lengthen, 2 Shorten and 3 Equal), binomial logit for decision change (0 Unchanged and 1 Changed) and verification mediator (1 Yes and 2 No). Gaussian is used for individual decision time as a continuous variable. Items related to institutional logics range from 1 Not at all, 2 A little, 3 Moderately, 4 Highly and 5 Extremely. Learning channels as moderator has 4 categories of 1 Visualer, 2 Auditoree, 3 Hapticer and 4 Balanced.

While most of the variables are categorical, therefore the best modeling is GSEM, generalized SEMs, which fits not just linear but generalized linear models and categorical variables, SEM is also applicable for this data sets as all variables have standard deviations between 0-3, individual decision time which is a continuous variable with a standard deviation of 4.7 is transformed using ln( ), log transformation, to achieve the criterion of normal distribution. With SEM, it is possible to have moderated mediation with a categorical moderator by a multiple group analysis using the group option. However, interactions are not explicit in the model. They are implicit in the multiple group analysis. Analysis is conducted on both GSEM and SEM, results in cases are comparable, and some correlations while are significant in SEM are not so in GSEM. Assumption in Standard linear SEMs is all variables in the model are distributed normally, generalized SEMs exclude observed variables and categorical latent variables from this assumption. Standard linear SEMs are a subset of generalized SEMs, the joint normality can be relaxed. The default estimation method is maximum likelihood, to obtain the variance–covariance matrix of the estimates (VCE), including standard errors, robust and clustered techniques are used alternatively for comparable results. The former requires errors are to be independently distributed while it does not require the errors to be normal nor identically distributed – robust to heteroskedasticity of the errors. The latter is a generalization relaxing the assumption of independently distributed errors, instead requires independence between the 14 clusters. Results are mostly nearly identical although there are a few cases where improved accuracy of standard errors thanks to such relaxation change coefficients and significance of the paths. Pairwise correlation coefficients between the variables are reported with their significance levels. Dummy variable, gender (0 Female, 1 Male), and control variables, year of birth (7 categories) and year of experience (8 categories) are also added in the saturated models.

IV. RESULTS

Result tables are in Appendix D. In general, results affirm correlations at significance level of $p<0.1$, $p<0.05$ and $p<0.001$. In Model 80 and Model 81, even though the p-values are 0.000s, pairwise correlations (e.g. Community – Decision change, 0.9186) are not meaningful, as a result hypothesis is not confirmed by these models. Not to mention moderated mediation significant when studying differences in strength of effect between learning channels categories of Visual, Auditory, Haptic and Balanced (See Appendix D: Table 29), hundreds of p-values are significant at 0.001, having taken into account the importance of pairwise correlations between variables in the models, Models summarized in Appendix D have a level of confidence intervals in pairwise correlations at least around 90%. Correlation results confirm influence of institutional logics on decision making at individual level both in mediated relations, GSEM models (See Appendix D: Tables 1-12), via different mediators, e.g. frequency of use by information types, effect of use by information characteristics – positive or negative, timing of availability, load of information at time of availability, information channels by information characteristics – positive or negative, and verification, either enhancing or reducing completeness of information in communication. SEM models (See Appendix D: Tables 13-28) further represent significant moderated mediation between institutional logics variables and decision making variables with learning channels as a moderator. Individuals categorize themselves as either learning mostly through visual, auditory or haptic channels or some have a balance between these three. This categorization moderates both paths of the indirect effect, and each category in the moderator correlates with the independent variables and dependent variables without uniformity, i.e. coefficients and p-values across categories are not alike (See Appendix D: Table 29). Control variables - year of birth, experience and dummy variable - gender are not significant in all saturated models.

For examples, mediation effects in Models 1-12, show that how high individuals' respect for and care about family values may affect the likelihood that they change their decision. However this is not simply a direct effect, instead it is an indirect effect depending on not only whether the information is positive or negative and through which channels it is communicated, what forms it is, how frequent such forms are used, their usual effect, at what time the information is made available but also the load. In particular, results affirm

[2] ScienceDirect provides a comprehensive overview of Likert Scales, referring to various researches using different constructs on scales of this type. https://www.sciencedirect.com/topics/psychology/likert-scale.

mediation effect of mainstream media regardless of information characteristics, i.e. whether it is positive or negative information. While other channels don't have a meaningful role, commercial media and close social contacts as well as family function as mediators when the information is positive. The frequency at which individuals use information in images also mediates that path to decision change, NB p-value is more significant with robust vce than clustered vce. When the information is positive, the usual effect of images on these individuals can cause indirect effect. On the condition that the load is big, whether the information is communicated before discussion or while discussion mediates how the independent variable affects decision change.

Other examples are Models 29-36. In these Models, the level at which a person obeys state laws affects the likelihood of decision change, however the path is mediated by channel of communication, frequency of use and usual effect. Specifically, similar to the mediation in Models 1-12, mainstream media regardless of information characteristics can cause indirect effect. While commercial media mediates to decision change when the information is positive, social network takes this role when the information is negative. How often individuals use information in forms of sound or images with sounds or augmented form can also function as mediators while other forms do not. When the information is positive, the usual effect of images mediates the path between the independent variable and decision change. Clustered technique increases significance levels in Models 30, 31, 33, 34, 36, in contrast robust technique leads to higher significance in Model 35.

Regarding integrated effect, Models 75-79 present moderated mediation patterns by which how high individuals respect for and care about family values can indirectly decides if they will change their decision or not through the mediation of timing, load and verification. Both paths of such mediation is moderated by learning channels, and in most cases clustered vce increases significance level. Under the moderation of learning channels, high load of information before or while discussion can mediate to decision change, or regardless if the load, just availability before discussion can function in the same way. In Models 108 – 113, how well individuals obey state laws indirectly affects decision change under the moderation of learning channels which moderates both paths of the mediations caused by channel of communication. The indirect effects exist when the information is positive and diffused through commercial media, negative information is transmitted in mainstream media or social network. For a better understanding of the effect of each category in the moderator, some examples are in Table 29.

V. DISCUSSION AND CONCLUSION

Results affirm integrated moderation and mediation effects between institutional logics items and decision related variables, however it is not necessarily true in other research contexts provided that components in the concept of institutional logics, e.g. socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules are highly culture-specific or nationally specific. Results from the data analysis, therefore, can only be generalized to the population sampled. Concerning the dependent variables, even though decision made, decision time, decision change and change in decision time can be associated with decisions regardless of decision typology, in this research the situation described is an investment decision, whether to invest or not to invest in a clean technology which might leads to innovations, market expansion, market dominance and increased profitability, so basically the decision being studied can be classified as a strategic decision rather than a generic one. As a result, this limits the generalization of findings to this certain category of decision. In terms of reliability, the consistency of the findings, i.e. replications are conditional on symmetry in population characteristics. Validity of findings is enhanced through the mixed methods applied, from conceptualizing the causal relationship based on existing literature, conducting pilot study, using focus group so as to hypothesize to quantitative analysis to confirm correlations with the awareness that correlations do not necessarily mean causality.

For the research question of how categorization and institutional logics influence decision-making quality in business activities, this mixed methods study using (G)SEM models, despite its minimum sample size and population of only business students, contributes valuable understanding of the relation between variables in an integrated moderation and mediation effect. The indirect and interaction effects between the three main categories – institutional logics, completeness of information and decision-making quality give a reason why decisions are potentially biased and imperfect. Level Completeness of information, which is decisive in decision making, varies as information, either negative or positive, is available at different time, with various load, in alternative forms, through a variety of information channels, used at various frequency, of different effect on users, who have different verification habit. Such variation mediates the paths between institutional logics components and decision variables. Learning channels, alternatively visual, auditory or haptic or a balance between them, also alter completeness of information, but function as a moderator affecting both paths in an integrated model instead of being a mediator. In this way it shows how to enhance decision-making, e.g. adjust quality dimensions. Are logics of DSS and AI flawless? Or the flaw is that institutional logics are not embedded in such logics? How logical is our logic?

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

APPENDIX

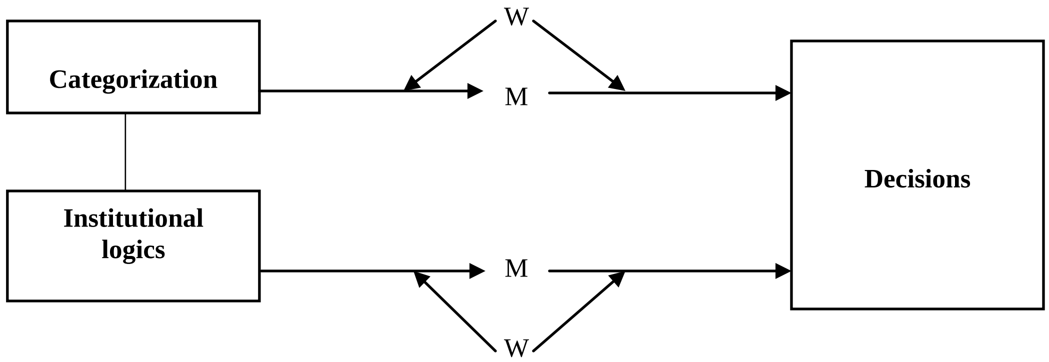
Appendix A: Conceptualization

Hoang, H.C., 2019, Influence of Multiple Institutional Logics and Social Categorization in decision making in business, ISBN 9789389090383

Decision making under categorization and institutional logics

Diversity		←→	**Information process**
Categorization	**Institutional logics**		
Subjective data scanning	Institutionally compatible	**Completeness of Information**	Noticing (Scanning data signaling surrounding environment)
Categorized meaning	Logics-based knowledge structure		Interpretation (Sense-making, cognitive theories)
Categorization-biased	Logic-neutralized		Action (on beliefs of surroundings)
Subsequent characteristics of decision making in diversity Inconsistencies: High vs. Low Coalitions and Bargaining: Strong vs. Weak Power: Sole source vs. Diverse power sources via Empowerment Models of exchange: Cooperative vs. Uncooperative			

Integrated moderation and mediation effects in group diversity
M: Mediator W: Moderator

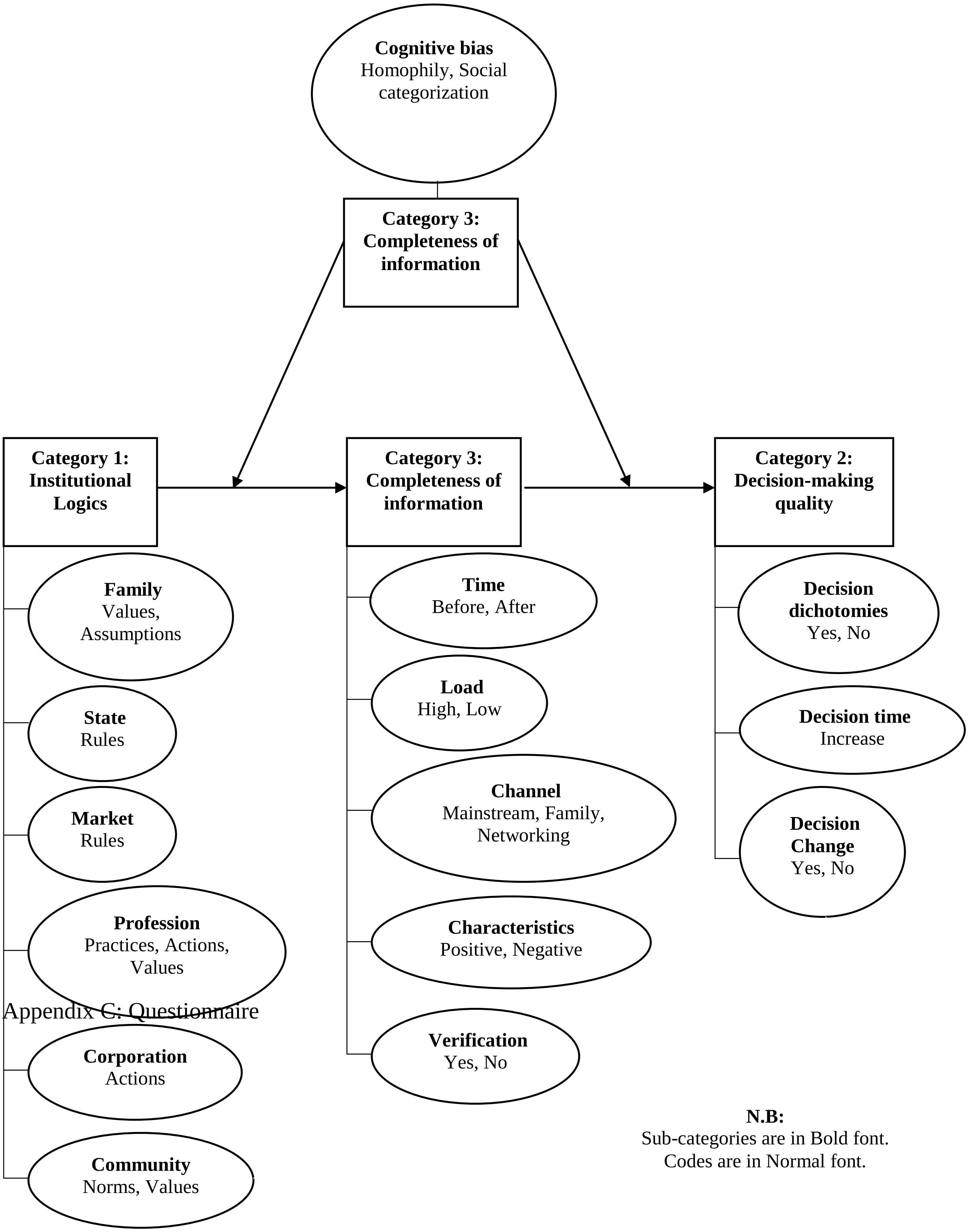


ISSN (Online): 2455-9024

Appendix B: Findings from focus group

Hoang, H.C., 2019, Influence of communication errors caused by the presence of multiple institutional logics and social categorization in decision-making in business activities – A focus group report, Rennes School of Business, DBA Program 2019, 19-20_RM_802E

Integrated effect



Appendix C: Questionnaire

Questionnaire PID:

2018	Gender:	Hair color:
Name:	Marital status :	Eye color:
Year of birth:	Height :	Favorite hair color :
Nationality:	Weight :	Favorite eye color :
Favorite color:	Profession :	Experience: year

Do you respect and care for family values?	1	2	3	4	5
Are you a community person?	1	2	3	4	5
Are you religious?	1	2	3	4	5
Are you laws-obedient?	1	2	3	4	5
Are you a material person?	1	2	3	4	5
Are you professional?	1	2	3	4	5
Are customers your Kings?	1	2	3	4	5

Scales: 1: Not at all 2: A little 3: Moderately 4: Significantly 5: Extremely

Community person: one who relates to people living in the same area, social group, sharing the same interests

Material person: one who relates physical objects or money rather than emotions or the spiritual world © Cambridge University Press 2013

Professional: having the qualities that you connect with trained and skilled people, such as effectiveness, skill, organization, and seriousness of manner © Cambridge University Press 2013

LEARNING CHANNEL PREFERENCE

Read each sentence carefully and consider whether it applies to you. On the line, write:
3 often applies **2** sometimes applies **1** never or almost never applies

Preferred Channel: VISUAL

_____ 1. I enjoy doodling and even my notes have lots of pictures, arrows, etc. in them.
_____ 2. I remember something better if I write it down.
_____ 3. When trying to remember a telephone number, or something new like that, it helps me to get a picture of it in my head.
_____ 4. When taking a test, I can "see" the textbook page and the correct answer on it.
_____ 5. Unless I write down directions, I am likely to get lost or arrive late.
_____ 6. It helps me to LOOK at a person speaking. It keeps me focused.
_____ 7. I can clearly picture things in my head.
_____ 8. It's hard for me to understand what a person is saying when there is background noise.
_____ 9. It's difficult for me to understand a joke when I hear it.
_____ 10. It's easier for me to get work done in a quiet place.

Visual Total _____

Preferred Channel: AUDITORY

_____ 1. When reading, I listen to the words in my head or read aloud.
_____ 2. To memorize something it helps me to say it over and over to myself.
_____ 3. I need to discuss things to understand them.
_____ 4. I don't need to take notes in class.
_____ 5. I remember what people have said better than what they were wearing.
_____ 6. I like to record things and listen to the tapes.
_____ 7. I'd rather hear a lecture on something rather than have to read it in a textbook.
_____ 8. I can easily follow a speaker even though my head is down on the desk or I'm staring out the window.
_____ 9. I talk to myself when I'm problem solving or writing.
_____ 10. I prefer to have someone tell me how to do something rather than have to read the directions myself.

Auditory Total _____

Preferred Channel: HAPTIC

_____ 1. I don't like to read or listen to directions; I'd rather just start doing.
_____ 2. I learn best when I am shown how to do something and then have the opportunity to do it.
_____ 3. I can study better when music is playing.
_____ 4. I solve problems more often with a trial-and-error, than a step-by-step approach.
_____ 5. My desk and/or locker looks disorganized.
_____ 6. I need frequent breaks while studying.
_____ 7. I take notes but never go back and read them.
_____ 8. I do not become easily lost, even in strange surroundings.
_____ 9. I think better when I have the freedom to move around; studying at a desk is not for me.
_____ 10. When I can't think of a specific word, I'll use my hands a lot and call something a "what-cha-ma-call-it" or a "thing-a-ma-jig."

Haptic Total _____

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

LEARNING STYLES

What do you prefer?

Please circle **Yes** or **No**

How often do you usually do it?

Please circle **0** (Never), **1** (Rarely), **2** (Occasionally), **3** (Sometimes), **4** (Often), **5** (Always)

Concrete experience	Yes	No	0	1	2	3	4	5
Compare it with reality	Yes	No	0	1	2	3	4	5
Identify differences (Problems)	Yes	No	0	1	2	3	4	5
Reflective observation	Yes	No	0	1	2	3	4	5
Select a problem	Yes	No	0	1	2	3	4	5
Consider alternative solution	Yes	No	0	1	2	3	4	5
Abstract conceptualization	Yes	No	0	1	2	3	4	5
Evaluate consequence of solution	Yes	No	0	1	2	3	4	5
Select a solution	Yes	No	0	1	2	3	4	5
Active experimentation	Yes	No	0	1	2	3	4	5
Execute the solution	Yes	No	0	1	2	3	4	5
Choose a model or goal	Yes	No	0	1	2	3	4	5

Decision: Invest (Yes) or **Not to invest (No)**

Situation: A car manufacturing company has to decide whether to invest or not to invest in a green technology. If the investment is successful, this company can maintain and/or enlarge their market to earn better profit. If it is not, the company can still benefit from innovations along the investment process or there won't be any innovations at all.

Please fill each blank with the importance of reasons for Yes or No decision.
1: Not at all 2: A little 3: Moderately 4: Significantly 5: Extremely
Please complete **both columns**. Then, circle **Invest** or **Not to invest**

Invest

____Customers are kings, so I want to provide the best products to them.
____Me and everyone around share our living environment, so I want to help protect the environment.
____My family has a tradition of protecting the environment, so I think investing in clean technology is the right thing to do.
____Different religions teach people to do good deeds, live with conscience. Environmental protection is a good and conscientious job.
____The market shows a high demand for eco-friendly cars.
____Investing in clean technology is a common trend for sustainable development.
____This investment is not against the law.
____Delivering products with good indicators helps buyers comply with relevant laws.
____If I need more capital than available, I can call for capital from the state, banks, investors and friends.
____Investing in clean technology brings certain improvements in thinking, production processes and management.
____This investment can be a good example to encourage other companies in the same industry to move towards sustainable development.
____Market shows that investing in this technology will increase the competitiveness of products.
____My family already has a business in this industry, I took their advice and decided to invest.
____I have consulted various sources of information. Investing in this technology is definitely profitable.

Not to invest

____Customers want good products, but they must be affordable.
____Environmental protection can be done in many ways. Investing in clean technology is not the only way.
____My family is not concerned about environmental protection so I do not see the importance of clean technology.
____Different religions teach people to do good deeds, live with conscience. Instead of investing in clean technology, I can do volunteer work.
____ The market shows that eco-friendly cars have a small market share.
____Investing in clean technology is a common trend for sustainable but costly to develop.
____This investment is not necessarily legal.
____There are illegal devices that can bring indicators to a level that is consistent with the relevant laws.
____If I need more capital than available, I cannot call for capital from the state, banks, investors and friends.
____Investing in clean technology brings certain improvements in thinking, production and management processes, but I do not need these improvements.
____Other companies in the same industry may also invest in the same technology and thus it is unlikely that the investment will increase the competitiveness of the product.
____Without this company, there will be another company to lead the trend, promote sustainable development.
____My family has no business in this industry, I have no sources of reference without motivation for competition, market or personal goals.
____I have consulted various sources of information. There is still a risk of business ethics.

____Other reason(s): ____

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

WHAT MAKES YOU CHANGE YOUR DECISION?

1. What are the forms of information you use to make decisions?

Please indicate frequency of use?

Select **1** (Rarely), **2** (Occasionally), **3** (Sometimes), **4** (Usually), **5** (Always)

Images	1	2	3	4	5
Sounds	1	2	3	4	5
Texts (without images)	1	2	3	4	5
Images and Sounds	1	2	3	4	5
Texts (with images)	1	2	3	4	5
All these augmented source	1	2	3	4	5

2. How do these formats affect your decisions?

Select **1** (Not at all), **2** (A little), **3** (Moderately), **4** (Significantly), **5** (Turn-around)

Positive information

Images	1	2	3	4	5
Sounds	1	2	3	4	5
Texts (without images)	1	2	3	4	5
Images and Sounds	1	2	3	4	5
Texts (with images)	1	2	3	4	5
All these augmented source	1	2	3	4	5

Negative information

Images	1	2	3	4	5
Sounds	1	2	3	4	5
Texts (without images)	1	2	3	4	5
Images and Sounds	1	2	3	4	5
Texts (with images)	1	2	3	4	5
All these augmented source	1	2	3	4	5

3. How important is timing of availability of such information?

Select **1** (Not at all), **2** (A little), **3** (Moderately), **4** (Significantly), **5** (Turn-around)

Before discussion	1	2	3	4	5
While discussion	1	2	3	4	5
Close to decision point	1	2	3	4	5
After decision made	1	2	3	4	5

4. How important is the load of such information? Select

1 (Not at all), **2** (A little), **3** (Moderately), **4** (Significantly), **5** (Turn-around)

A lot, before discussion	1	2	3	4	5
Little, before discussion	1	2	3	4	5
A lot, while discussion	1	2	3	4	5
Little, while discussion	1	2	3	4	5
A lot, close to decision point	1	2	3	4	5
Little, close to decision point	1	2	3	4	5
A lot, after decision made	1	2	3	4	5
Little, after decision made	1	2	3	4	5

5. How do channels of information affect your decisions? Select

1 (Not at all), **2** (A little), **3** (Moderately), **4** (Significantly), **5** (Turn-around)

Positive information

Mainstream (State-owned media)	1	2	3	4	5
Commercial media	1	2	3	4	5
Social network	1	2	3	4	5
Close social contacts	1	2	3	4	5
Family					

Negative information

Mainstream (State-owned media)	1	2	3	4	5
Commercial media	1	2	3	4	5
Social network	1	2	3	4	5
Close social contacts	1	2	3	4	5
Family					

6. Do you verify information depending its on formats?

Select Yes or No

Format	**Select**	
Images	Yes	No
Sounds	Yes	No
Texts (without images)	Yes	No
Images and Sounds	Yes	No
Texts (with images)	Yes	No
All these augmented source	Yes	No

7. According to you, how do these above factors in affect the length of time necessary for your decision making?

Equal Shorter Longer Other: ________________

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

Appendix D: Result tables

GSEM

Table 1: Mediation effect on decision change Model 1- Model 6

	(1) Channel_Main Posi	(2) Channel_Com Posi	(3) Channel_Cliq Posi	(4) Channel_Main Neg	(5) Freq Images	(6) Freq Sounds	
Family	0.516**	0.537**	0.403*	0.463**	0.372*	0.322	robust
	(0.188)	(0.182)	(0.184)	(0.151)	(0.181)	(0.185)	
	0.516**	0.537**	0.403*	0.463***	0.372	0.322	cluster
	(0.198)	(0.177)	(0.189)	(0.135)	(0.217)	(0.179)	
Decision change							
	0.629***	1.115***	0.404**	0.434***	0.469***	0.374**	robust
	(0.117)	(0.207)	(0.139)	(0.0973)	(0.129)	(0.130)	
	0.629***	1.115***	0.404*	0.434***	0.469***	0.374**	cluster
	(0.0926)	(0.226)	(0.160)	(0.103)	(0.128)	(0.141)	
N	421	421	421	420	427	426	

Standard errors in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Table 2: Mediation effect on decision change Model 7 – Model 12

	(7) Efimages Posi	(8) Aug Efneg	(9) Timing Bef	(10) Timing Whi	(11) Load Lots Bef	(12) Load Lots Whi	
Family	0.563***	0.340	0.351	0.314	0.568***	0.395*	robust
	(0.166)	(0.174)	(0.201)	(0.187)	(0.164)	(0.195)	
	0.563***	0.340	0.351*	0.314*	0.568***	0.395*	cluster
	(0.128)	(0.232)	(0.144)	(0.141)	(0.156)	(0.172)	
Decision change							
	0.825***	0.648***	0.477***	0.923***	0.497***	0.617***	robust
	(0.140)	(0.102)	(0.109)	(0.166)	(0.113)	(0.149)	
	0.825***	0.648***	0.477***	0.923***	0.497***	0.617***	cluster
	(0.127)	(0.114)	(0.122)	(0.157)	(0.0956)	(0.183)	
N	425	423	424	424	416	413	

Standard errors in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Table 3: Mediation effect on decision Model 13 – Model 16

	(13) Freq Sounds	(14) Efsounds Posi	(15) Load LiAf	(16) Vefi Twoimages	
Community	0.309**	0.203	0.312**	0.311	robust
	(0.120)	(0.115)	(0.111)	(0.171)	
	0.309**	0.203*	0.312***	0.311	cluster
	(0.0975)	(0.0961)	(0.0941)	(0.174)	
1b.Undecided					
2.Yes					
3.No					
	-0.348	-0.425	-0.310	-0.920	robust
	(0.222)	(0.265)	(0.176)	(0.476)	
	-0.348	-0.425	-0.310*	-0.920*	cluster
	(0.188)	(0.273)	(0.139)	(0.418)	
N	426	424	415	419	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 4: Mediation effect on decision time Model 17 – Model 21

	(17) Timing Af	(18) Load LiNear	(19) Load LiAf	(20) Vefi Sounds	(21) Vefi Twoimages	
Community	0.191	0.262*	0.312**	0.400**	0.311	robust
	(0.111)	(0.117)	(0.111)	(0.14)	(0.171)	
	0.191	0.262**	0.312***	0.400**	0.311	cluster
	(0.127)	(0.0916)	(0.0941)	(0.153)	(0.174)	
Decision time						
	0.0203*	0.0198	0.0272**	0.0457	-0.0648*	robust
	(0.00913)	(0.0112)	(0.00997)	(0.025)	(0.033)	
	0.0203**	0.0198	0.0272	0.0457*	-0.0648*	cluster
	(0.00769)	(0.0110)	(0.0141)	(0.0208)	(0.0259)	
N	424	412	415	417	419	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 5: Mediation effect on decision Model 28

	(28) Channel_Com Neg	
Channel_Com Neg		
Religion	0.140	robust
	(0.0818)	
	0.140*	cluster
	(0.0640)	
1b.Undecided		
2.Yes		
3.No		
	-0.396	robust
	(0.252)	
	-0.396	cluster
	(0.244)	
N	419	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 6: Mediation effect on decision change Model 29 – Model 36

	(29) Channel_Main Posi	(30) Channel_Com Posi	(31) Channel_Main Neg	(32) Channel_SN Neg	(33) Freq Sounds	(34) Freg Imagsou	(35) Freg Aug	(36) Efimages Posi	
State	0.496***	0.350**	0.285*	0.282*	0.320**	0.328**	0.261*	0.270*	robust
	(0.137)	(0.124)	(0.125)	(0.143)	(0.111)	(0.122)	(0.131)	(0.131)	
	0.496***	0.350***	0.285**	0.282*	0.320***	0.328***	0.261	0.270**	cluster
	(0.108)	(0.0795)	(0.102)	(0.127)	(0.0970)	(0.0844)	(0.148)	(0.0832)	
Decision change									
	0.629***	1.115***	0.434***	0.322**	0.374**	0.723***	0.454***	0.825***	robust
	(0.117)	(0.207)	(0.0973)	(0.109)	(0.130)	(0.137)	(0.119)	(0.140)	
	0.629***	1.115***	0.434***	0.322*	0.374**	0.723***	0.454***	0.825***	cluster
	(0.0926)	(0.226)	(0.103)	(0.146)	(0.141)	(0.114)	(0.122)	(0.127)	
N	421	421	420	420	426	424	426	425	

Standard errors in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Table 7: Mediation effect on decision change Model 37 – Model 44

	(37) Efsounds Posi	(38) Ef ImagSou Posi	(39) Ef Twimag Posi	(40) Ef Aug Posi	(41) Efimages Neg	(42) Timing Bef	(43) Load Lots Bef	(44) Load Lots Whi	
State	0.226	0.229	0.255*	0.234	0.326**	0.283*	0.338**	0.324*	robust
	(0.130)	(0.128)	(0.120)	(0.146)	(0.123)	(0.128)	(0.122)	(0.144)	
	0.226	0.229*	0.255*	0.234	0.326**	0.283**	0.338**	0.324*	cluster
	(0.144)	(0.0984)	(0.121)	(0.150)	(0.106)	(0.107)	(0.115)	(0.142)	
Decision change									
	0.618***	0.726***	0.685***	0.756***	0.628***	0.477***	0.497***	0.617***	robust
	(0.141)	(0.150)	(0.143)	(0.117)	(0.112)	(0.109)	(0.113)	(0.149)	
	0.618***	0.726***	0.685***	0.756***	0.628***	0.477***	0.497***	0.617***	cluster
	(0.121)	(0.137)	(0.106)	(0.0883)	(0.0627)	(0.122)	(0.0956)	(0.183)	
N	424	424	425	425	423	424	416	413	

Standard errors in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Table 8: Mediation effect on decision change Model 45 – Model 49

	(45) Channel_Com Posi	(46) Channel_Main Neg	(47) Channel_Com Neg	(48) Channel_Cliq Neg	(49) Freq Images	
Market	0.310**	0.228	0.252*	0.316*	0.257*	robust
	(0.114)	(0.122)	(0.122)	(0.123)	(0.124)	
	0.310**	0.228	0.252	0.316*	0.257	cluster
	(0.113)	(0.160)	(0.204)	(0.129)	(0.153)	
Decision change	1.115***	0.434***	0.512***	0.337**	0.469***	robust
	(0.207)	(0.0973)	(0.135)	(0.117)	(0.129)	
	1.115***	0.434***	0.512***	0.337**	0.469***	cluster
	(0.226)	(0.103)	(0.107)	(0.106)	(0.128)	
N	421	420	419	420	427	

Standard errors in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Table 9: Mediation effect on decision change Model 50 – Model 53

	(50)	(51)	(52)	(53)	
	Freq Sounds	Efimages Neg	Textimages Efneg	Timing Bef	
Market	0.225	0.338**	0.244*	0.240*	robust
	(0.122)	(0.118)	(0.112)	(0.113)	
	0.225*	0.338***	0.244**	0.240**	cluster
	(0.108)	(0.0999)	(0.0909)	(0.0923)	
Decision change	0.374**	0.628***	0.492***	0.477***	robust
	(0.130)	(0.112)	(0.126)	(0.109)	
	0.374**	0.628***	0.492***	0.477***	cluster
	(0.141)	(0.0627)	(0.100)	(0.122)	
N	426	423	423	424	

Standard errors in parentheses
* p<0.05 * p<0.05 * p<0.05

Table 10: Mediation effect on decision Model 54 – Model 57

	(54)	(55)	(56)	(57)	
	Channel_Com Neg	Freq Sounds	Freq Twoimag	Timing Bef	
Market	0.252*	0.225	0.221	0.240*	robust
	(0.122)	(0.122)	(0.114)	(0.113)	
	0.252	0.225*	0.221	0.240**	cluster
	(0.204)	(0.108)	(0.150)	(0.0923)	
1b.Undecided					
2.Yes					
3.No	-0.396	-0.348	0.388	0.372	robust
	(0.252)	(0.222)	(0.236)	(0.276)	
	-0.396	-0.348	0.388	0.372	cluster
	(0.244)	(0.188)	(0.202)	(0.205)	
N	419	426	428	424	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 11: Mediation effect on decision change Model 58 – Model 60

	(58)	(59)	(60)	
	Freq Sounds	Efsounds Posi	Timing Bef	
Professional	0.325**	0.219	0.377**	robust
	(0.120)	(0.122)	(0.134)	
	0.325**	0.219	0.377*	cluster
	(0.122)	(0.129)	(0.171)	
1b.Undecided				
2.Yes				
3.No	-0.348	-0.425	0.372	robust
	(0.222)	(0.265)	(0.276)	
	-0.348	-0.425	0.372	cluster
	(0.188)	(0.273)	(0.205)	
N	426	424	424	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 12: Mediation effect on decision time Model 61 – Model 66

	(61)	(62)	(63)	(64)	(65)	(66)	
	Channel_Main Neg	Efimages Posi	Efimages Neg	Efsou Neg	Timing Bef	Load Lots Bef	
Professional	0.208	0.293*	0.217	0.250*	0.377**	0.265*	robust
	(0.126)	(0.127)	(0.124)	(0.126)	(0.126)	(0.126)	
	0.208	0.293*	0.217	0.250*	0.377**	0.265*	cluster
	(0.126)	(0.127)	(0.124)	(0.126)	(0.126)	(0.126)	
1b.Lengthen							
2.Shorten							
3.Equal	-0.523**	-0.691**	-0.424*	-0.365	-0.565**	-0.864***	robust
	(0.189)	(0.239)	(0.199)	(0.224)	(0.209)	(0.212)	
	-0.523**	-0.691**	-0.424*	-0.365	-0.565**	-0.864***	cluster
	(0.189)	(0.239)	(0.199)	(0.224)	(0.209)	(0.212)	
N	420	425	423	422	424	416	

Standard errors in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

SEM

Table 13: Integrated effect on decision change Model 67 – Model 70

	(67)	(68)	(69)	(70)	
Learning channels#c.Family	0.227**	0.177*	0.265**	0.195*	robust
	(0.0704)	(0.0875)	(0.0950)	(0.0918)	
	0.227***	0.177*	0.265***	0.195***	cluster
	(0.0658)	(0.0855)	(0.0671)	(0.0488)	
Learning channels	2.369***	2.762***	2.554***	2.813***	robust
	(0.336)	(0.418)	(0.454)	(0.442)	
	2.369***	2.762***	2.554***	2.813***	cluster
	(0.310)	(0.399)	(0.308)	(0.220)	
Decision change	Learning channels# c.Channel_Com Posi	Learning channels# c.Channel_Cliq Posi	Learning channels# c.Channel_Main Neg	Learning channels# c.Freq Images	
	0.103***	0.0401**	0.0475***	0.0525**	robust
	(0.0196)	(0.0144)	(0.0127)	(0.0160)	
	0.103***	0.0401**	0.0475***	0.0525**	cluster
	(0.0235)	(0.0139)	(0.0128)	(0.0165)	
Learning channels	0.533***	0.744***	0.707***	0.686***	robust
	(0.0776)	(0.0592)	(0.0575)	(0.0677)	
	0.533***	0.744***	0.707***	0.686***	cluster
	(0.0927)	(0.0573)	(0.0586)	(0.0663)	
N	421	421	420	426	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 14: Integrated effect on decision change Model 71 – Model 74

	(71)	(72)	(73)	(74)	
Learning channels#c.Family	0.144	0.294***	0.206	0.198	robust
	(0.0928)	(0.0875)	(0.110)	(0.107)	
	0.144	0.294***	0.206*	0.198**	cluster
	(0.0870)	(0.0801)	(0.0825)	(0.0627)	
Learning channels	2.753***	2.292***	3.034***	2.802***	robust
	(0.445)	(0.419)	(0.526)	(0.515)	
	2.753***	2.292***	3.034***	2.802***	cluster
	(0.444)	(0.388)	(0.403)	(0.307)	
Decision change	Learning channels# c.Freq Sounds	Learning channels# c.Efimages Posi	Learning channels# c.Aug Efneg	Learning channels# c.Timing Bef	
	0.0394**	0.0857***	0.0757***	0.0507***	robust
	(0.0144)	(0.0161)	(0.0150)	(0.0132)	
	0.0394*	0.0857***	0.0757***	0.0507***	cluster
	(0.0161)	(0.0126)	(0.0164)	(0.0103)	
Learning channels	0.747***	0.567***	0.582***	0.697***	robust
	(0.0567)	(0.0702)	(0.0704)	(0.0584)	
	0.747***	0.567***	0.582***	0.697***	cluster
	(0.0651)	(0.0510)	(0.0779)	(0.0506)	
N	426	425	423	424	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 15: Integrated effect on decision change Model 75 – Model 79

	(75)	(76)	(77)	(79)	
Learning channels#c.Family	0.150	0.319***	0.184*	0.0884*	robust
	(0.0808)	(0.0941)	(0.0822)	(0.0442)	
	0.150**	0.319**	0.184**	0.0884***	cluster
	(0.0484)	(0.114)	(0.0573)	(0.0224)	
Learning channels	2.996***	2.237***	2.843***	0.298	robust
	(0.385)	(0.452)	(0.392)	(0.212)	
	2.996***	2.237***	2.843***	0.298**	cluster
	(0.223)	(0.560)	(0.262)	(0.112)	
Decision change	Learning channels#c.Timing Whi	Learning channels#c.Load Lots Bef	Learning channels#c.Load Lots Whi	Learning channels#c.Vefi Sounds	
	0.0897***	0.0520***	0.0625***	-0.0272	robust
	(0.0179)	(0.0138)	(0.0166)	(0.0328)	
	0.0897***	0.0520***	0.0625***	-0.0272	cluster
	(0.0179)	(0.00877)	(0.0154)	(0.0349)	
Learning channels	0.554***	0.697***	0.659***	0.907***	robust
	(0.0766)	(0.0609)	(0.0707)	(0.0268)	
	0.554***	0.697***	0.659***	0.907***	cluster
	(0.0815)	(0.0393)	(0.0652)	(0.0242)	
N	424	416	413	417	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 16: Integrated effect on decision change Model 80 – Model 81

	(80)	(81)	
Learning channels#c.Community	0.144**	0.108	robust
	(0.0489)	(0.0731)	
	0.144***	0.108	cluster
	(0.0361)	(0.0730)	
Learning channels	2.950***	3.438***	robust
	(0.174)	(0.259)	
	2.950***	3.438***	cluster
	(0.153)	(0.252)	
Decision change	Learning channels#c.Channel_Com Posi	Learning channels#c.Channel_Main Neg	
	0.103***	0.0475***	robust
	(0.0196)	(0.0127)	
	0.103***	0.0475***	cluster
	(0.0235)	(0.0128)	
Learning channels	0.533***	0.707***	robust
	(0.0776)	(0.0575)	
	0.533***	0.707***	cluster
	(0.0927)	(0.0586)	
N	421	420	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 17: Integrated effect on decision change Model 144

(144)	robust	cluster
Learning channels#c.State	0.191	0.191
	(0.138)	(0.228)
	0.139	0.139
	(0.119)	(0.154)
	0.105	0.105**
	(0.127)	(0.0326)
	0.227*	0.227**
	(0.107)	(0.0860)
Learning channels	2.822***	2.822**
	(0.619)	(0.976)
	3.088***	3.088***
	(0.525)	(0.660)
	3.353***	3.353***
	(0.567)	(0.223)
	2.748***	2.748***
	(0.464)	(0.401)
Decision change	Learning channels#c.Load Lots Whi	Learning channels#c.Load Lots Whi
	0.0570	0.0570**
	(0.0336)	(0.0201)
	0.0802*	0.0802**
	(0.0380)	(0.0274)
	0.104*	0.104**
	(0.0421)	(0.0387)
	0.0231	0.0231
	(0.0224)	(0.0241)
Learning channels	0.620***	0.620***
	(0.139)	(0.0608)
	0.595***	0.595***
	(0.165)	(0.121)
	0.507**	0.507**
	(0.180)	(0.157)
	0.856***	0.856***
	(0.0935)	(0.0941)
N	413	413

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

Table 18: Integrated effect on decision Model 88

(88)	robust	cluster
Channel_Com Neg		
Learning channels#c.Religion	0.0735	0.0735
	(0.0395)	(0.0393)
Learning channels	3.242***	3.242***
	(0.0885)	(0.0835)
Decision		
Learning channels#c.Channel_Com Neg	-0.0517	-0.0517
	(0.0303)	(0.0350)
Learning channels	1.976***	1.976***
	(0.106)	(0.124)
N	407	407

Standard errors in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Table 19: Integrated effect on decision time Model 93 – Model 95

	(93)	(95)	
Learning channels#c.Community	0.0789**	0.0402	robust
	(0.0265)	(0.0218)	
	0.0789**	0.0402	cluster
	(0.0257)	(0.0236)	
Learning channels	0.445***	0.706***	robust
	(0.0970)	(0.0801)	
	0.445***	0.706***	cluster
	(0.0945)	(0.0863)	
Decision time	Learning channels# c.Vefi Sounds	Learning channels# c.Vefi Twoimages	
	0.0739	-0.108	robust
	(0.0401)	(0.0565)	
	0.0739	-0.108	cluster
	(0.0393)	(0.0597)	
Learning channels	1.582***	1.729***	robust
	(0.0333)	(0.0530)	
	1.582***	1.729***	cluster
	(0.0296)	(0.0551)	
N	417	419	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 20: Integrated effect on decision change Model 97 – Model 105

	(97)	(99)	(101)	(103)	(105)	
Learning channels# c.Religion	0.0700	0.103*	0.0789	0.121**	0.156***	robust
	(0.0386)	(0.0489)	(0.0427)	(0.0415)	(0.0455)	
	0.0700*	0.103**	0.0789**	0.121***	0.156***	cluster
	(0.0327)	(0.0395)	(0.0303)	(0.0330)	(0.0404)	
Learning channels	3.245***	3.246***	3.213***	2.931***	2.629***	robust
	(0.0870)	(0.105)	(0.0977)	(0.0916)	(0.0958)	
	3.245***	3.246***	3.213***	2.931***	2.629***	cluster
	(0.0670)	(0.0959)	(0.0772)	(0.0846)	(0.0906)	
Decision change	Learning channels# c.Channel_Com Neg	Learning channels# c.Channel_Cliq Neg	Learning channels# c.Efsou Neg	Learning channels# c.Ef Twoimag Neg	Learning channels# c.Load LiWhi	
	0.0528***	0.0353**	0.0552***	0.0274*	0.0288*	robust
	(0.0158)	(0.0125)	(0.0131)	(0.0127)	(0.0130)	
	0.0528**	0.0353*	0.0552**	0.0274	0.0288**	cluster
	(0.0190)	(0.0143)	(0.0175)	(0.0158)	(0.0108)	
Learning channels	0.712***	0.769***	0.703***	0.802***	0.809***	robust
	(0.0615)	(0.0507)	(0.0540)	(0.0468)	(0.0449)	
	0.712***	0.769***	0.703***	0.802***	0.809***	cluster
	(0.0761)	(0.0538)	(0.0694)	(0.0582)	(0.0396)	
N	418	419	421	422	409	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 21: Integrated effect on decision change Model 108 – Model 113

	(108)	cluster	(110)	cluster	(112)	cluster	(113)	cluster
Learning channels#c.State	0.128*	0.128*	0.253	0.253**	0.168*	0.168*	0.463***	0.463***
	(0.0519)	(0.0610)	(0.135)	(0.0779)	(0.0791)	(0.0696)	(0.131)	(0.0660)
			0.0736	0.0736			-0.122	-0.122
			(0.160)	(0.205)			(0.166)	(0.107)
			0.234	0.234*			0.129	0.129
			(0.145)	(0.112)			(0.141)	(0.106)
			-0.0286	-0.0286			0.165	0.165
			(0.132)	(0.0901)			(0.155)	(0.127)
Learning channels	2.894***	2.894***	2.802***	2.802***	2.288***	2.288***	0.824	0.824*
	(0.228)	(0.260)	(0.586)	(0.378)	(0.349)	(0.334)	(0.561)	(0.357)
			3.236***	3.236***			3.774***	3.774***
			(0.682)	(0.767)			(0.743)	(0.468)
			2.921***	2.921***			2.483***	2.483***
			(0.610)	(0.407)			(0.615)	(0.417)
			3.949***	3.949***			2.316***	2.316***
			(0.570)	(0.372)			(0.682)	(0.664)
Decision change	Learning channels# c.Channel_Com Posi		Learning channels# c.Channel_Main Neg		Learning channels# c.Channel_SN Neg		Learning channels# c.Channel_SN Neg	
	0.103***	0.103***	0.0812*	0.0812***	0.0311**	0.0311**	0.0349	0.0349
	(0.0196)	(0.0235)	(0.0316)	(0.0201)	(0.0108)	(0.0111)	(0.0268)	(0.0261)
			0.0546	0.0546			0.0862**	0.0862**
			(0.0297)	(0.0422)			(0.0323)	(0.0270)
			0.0362	0.0362**			0.00245	0.00245
			(0.0222)	(0.0116)			(0.0180)	(0.0165)
			0.0264	0.0264***			0.00748	0.00748***
			(0.0166)	(0.00678)			(0.0115)	(0.00225)
Learning channels	0.533***	0.533***	0.508***	0.508***	0.794***	0.794***	0.725***	0.725***
	(0.0776)	(0.0927)	(0.144)	(0.0893)	(0.0411)	(0.0450)	(0.0911)	(0.0952)
			0.686***	0.686***			0.602***	0.602***
			(0.126)	(0.186)			(0.130)	(0.122)
			0.764***	0.764***			0.899***	0.899***
			(0.106)	(0.0522)			(0.0632)	(0.0579)
			0.841***	0.841***			0.920***	0.920***
			(0.0780)	(0.0409)			(0.0450)	(0.0177)
N	421	421	420	420	420	420	420	420

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 22: Integrated effect on decision change Model 115

	(115)	cluster
Learning channels#c.State	0.242	0.242*
	(0.125)	(0.100)
	0.282**	0.282**
	(0.0947)	(0.0958)
	-0.163	-0.163
	(0.107)	(0.109)
	0.280**	0.280**
	(0.105)	(0.0917)
Learning channels	2.309***	2.309***
	(0.528)	(0.462)
	2.270***	2.270***
	(0.393)	(0.404)
	3.998***	3.998***
	(0.446)	(0.447)
	2.375***	2.375***
	(0.463)	(0.389)
Decision change	Learning channels#c.Freq Sounds	
	0.0126	0.0126
	(0.0277)	(0.0290)
	0.0942*	0.0942*
	(0.0408)	(0.0437)
	0.0529	0.0529*
	(0.0310)	(0.0241)
	0.00630	0.00630
	(0.0152)	(0.00674)
Learning channels	0.783***	0.783***
	(0.102)	(0.113)
	0.550***	0.550**
	(0.166)	(0.173)
	0.714***	0.714***

	(0.119)	(0.104)
	0.912***	0.912***
	(0.0617)	(0.0212)
N	426	426

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 23: Integrated effect on decision change Model 116 – Model 126

	(116)	(118)	(120)	(122)	(124)	(126)	
Learning channels# c.State	0.149**	0.149**	0.119	0.143*	0.111	0.107	robust
	(0.0566)	(0.0561)	(0.0694)	(0.0669)	(0.0637)	(0.0552)	
	0.149	0.149*	0.119	0.143	0.111	0.107*	cluster
	(0.0808)	(0.0613)	(0.0758)	(0.0823)	(0.0762)	(0.0507)	
Learning channels	2.794***	3.366***	3.675***	3.070***	2.938***	3.439***	robust
	(0.243)	(0.246)	(0.303)	(0.295)	(0.277)	(0.244)	
	2.794***	3.366***	3.675***	3.070***	2.938***	3.439***	cluster
	(0.332)	(0.270)	(0.338)	(0.370)	(0.329)	(0.238)	
Decision change	Learning channels# c.Freq Sounds	Learning channels# c.Freg Imagsou	Learning channels# c.Freg Aug	Learning channels# c.Efimages Posi	Learning channels# c.Efsounds Posi	Learning channels# c.Ef ImagSou Posi	
	0.0394**	0.0795***	0.0544**	0.0857***	0.0641***	0.0793***	robust
	(0.0144)	(0.0173)	(0.0166)	(0.0161)	(0.0157)	(0.0183)	
	0.0394*	0.0795***	0.0544**	0.0857***	0.0641***	0.0793***	cluster
	(0.0161)	(0.0205)	(0.0185)	(0.0126)	(0.0184)	(0.0195)	
Learning channels	0.747***	0.563***	0.655***	0.567***	0.663***	0.573***	robust
	(0.0567)	(0.0791)	(0.0769)	(0.0702)	(0.0630)	(0.0807)	
	0.747***	0.563***	0.655***	0.567***	0.663***	0.573***	cluster
	(0.0651)	(0.0910)	(0.0816)	(0.0510)	(0.0749)	(0.0859)	
N	426	424	425	425	424	424	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 24: Integrated effect on decision change Model 128 – Model 137

	(128)	(130)	(132)	(134)	cluster	(135)	(137)	
Learning channels# c.State	0.112	0.118	0.191*	0.322*	0.322***	0.118	0.130	robust
	(0.0575)	(0.0734)	(0.0755)	(0.134)	(0.0876)	(0.0699)	(0.0777)	
	0.112*	0.118	0.191**	0.229	0.229	0.118	0.130	cluster
	(0.0514)	(0.0657)	(0.0635)	(0.142)	(0.128)	(0.0715)	(0.0815)	
				-0.00893	-0.00893			
				(0.128)	(0.111)			
				-0.0125	-0.0125			
				(0.151)	(0.163)			
Learning channels	3.306***	3.730***	2.870***	1.989***	1.989***	2.850***	3.457***	robust
	(0.252)	(0.323)	(0.330)	(0.581)	(0.338)	(0.305)	(0.345)	
	3.306***	3.730***	2.870***	2.372***	2.372***	2.850***	3.457***	cluster
	(0.212)	(0.291)	(0.288)	(0.622)	(0.673)	(0.296)	(0.371)	
				3.382***	3.382***			
				(0.546)	(0.433)			
				3.390***	3.390***			
				(0.667)	(0.624)			
Decision change	Learning channels# c.Ef Twimag Posi	Learning channels# c.Ef Aug Posi	Learning channels# c.Efimages Neg	Learning channels# c.Efsou Neg		Learning channels# c.Efsou Neg	Learning channels# c.Aug Efneg	
	0.0734***	0.0961***	0.0656***	0.0420	0.0420	0.0538***	0.0757***	robust
	(0.0169)	(0.0183)	(0.0135)	(0.0272)	(0.0339)	(0.0132)	(0.0150)	
	0.0734***	0.0961***	0.0656***	0.0889*	0.0889*	0.0538**	0.0757***	cluster
	(0.0140)	(0.0196)	(0.0120)	(0.0349)	(0.0390)	(0.0170)	(0.0164)	
				0.0847**	0.0847*			
				(0.0295)	(0.0348)			
				0.0185	0.0185			
				(0.0136)	(0.0142)			
Learning channels	0.604***	0.475***	0.644***	0.683***	0.683***	0.706***	0.582***	robust
	(0.0735)	(0.0888)	(0.0604)	(0.108)	(0.106)	(0.0540)	(0.0704)	
	0.604***	0.475***	0.644***	0.580***	0.580***	0.706***	0.582***	cluster
	(0.0610)	(0.0954)	(0.0555)	(0.143)	(0.154)	(0.0654)	(0.0779)	
				0.613***	0.613***			
				(0.123)	(0.141)			
				0.881***	0.881***			
				(0.0589)	(0.0594)			

N	425	425	423	422	422	422	423

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 25: Integrated effect on decision change Model 139 – Model 145

	(139)	(141)	cluster	(142)	(145)	
Learning channels#						robust
c.State	0.158*	0.0770	0.0770	0.192**	0.162**	
	(0.0732)	(0.122)	(0.0761)	(0.0686)	(0.0624)	
	0.158**	0.393*	0.393***	0.192**	0.162*	cluster
	(0.0531)	(0.155)	(0.102)	(0.0591)	(0.0779)	
		0.146	0.146*			
		(0.134)	(0.0727)			
		0.168	0.168			
		(0.141)	(0.111)			
Learning channels	3.060***	3.420***	3.420***	2.921***	3.016***	robust
	(0.320)	(0.539)	(0.372)	(0.304)	(0.277)	
	3.060***	2.094**	2.094***	2.921***	3.016***	cluster
	(0.230)	(0.709)	(0.549)	(0.267)	(0.336)	
		3.074***	3.074***			
		(0.585)	(0.332)			
		3.018***	3.018***			
		(0.622)	(0.490)			
Decision change	Learning channels# c.Timing Bef	Learning channels# c.Load Lots Bef		Learning channels# c.Load Lots Bef	Learning channels# c.Load Lots Whi	
	0.0507***	0.0505	0.0505***	0.0520***	0.0625***	robust
	(0.0132)	(0.0308)	(0.0119)	(0.0138)	(0.0166)	
	0.0507***	0.0671	0.0671***	0.0520***	0.0625***	cluster
	(0.0103)	(0.0372)	(0.0191)	(0.00877)	(0.0154)	
		0.0696*	0.0696***			
		(0.0279)	(0.0156)			
		0.0315	0.0315***			
		(0.0176)	(0.00938)			
Learning channels	0.697***	0.639***	0.639***	0.697***	0.659***	robust
	(0.0584)	(0.132)	(0.0429)	(0.0609)	(0.0707)	
	0.697***	0.636***	0.636***	0.697***	0.659***	cluster
	(0.0506)	(0.160)	(0.0723)	(0.0393)	(0.0652)	
		0.648***	0.648***			
		(0.127)	(0.0563)			
		0.824***	0.824***			
		(0.0816)	(0.0420)			
N	424	416	416	416	413	

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 26: Integrated effect on decision change Model 147 – Model 150

	(147)	(148)	(149)	(150)	
Learning channels#					robust
c.Market	0.125**	0.143*	0.110	0.165*	
	(0.0468)	(0.0725)	(0.0589)	(0.0687)	
	0.125**	0.143	0.110	0.165	cluster
	(0.0460)	(0.0964)	(0.0719)	(0.0855)	
Learning channels	3.007***	3.306***	2.982***	2.851***	robust
	(0.167)	(0.265)	(0.213)	(0.245)	
	3.007***	3.306***	2.982***	2.851***	cluster
	(0.197)	(0.351)	(0.257)	(0.348)	
Decision change	Learning channels# c.Channel_Com Posi	Learning channels# c.Channel_Main Neg	Learning channels# c.Channel_Com Neg	Learning channels# c.Channel_Cliq Neg	
	0.103***	0.0475***	0.0538***	0.0341**	robust
	(0.0196)	(0.0127)	(0.0159)	(0.0126)	
	0.103***	0.0475***	0.0538**	0.0341*	cluster
	(0.0235)	(0.0128)	(0.0167)	(0.0143)	
Learning channels	0.533***	0.707***	0.706***	0.771***	
	(0.0776)	(0.0575)	(0.0617)	(0.0508)	robust
	0.533***	0.707***	0.706***	0.771***	
	(0.0927)	(0.0586)	(0.0681)	(0.0541)	cluster
N	421	420	419	420	

Standard errors in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Table 27: Integrated effect on decision change Model 151 - 155

	(151)	(152)	(153)	(154)	(155)	
Learning channels# c.Market	0.122*	0.112	0.203**	0.121*	0.140*	robust
	(0.0588)	(0.0600)	(0.0688)	(0.0614)	(0.0639)	
	0.122*	0.112	0.203**	0.121	0.140*	cluster
	(0.0606)	(0.0816)	(0.0664)	(0.0637)	(0.0632)	
Learning channels	3.306***	3.040***	2.976***	3.184***	3.241***	robust
	(0.216)	(0.217)	(0.254)	(0.220)	(0.234)	
	3.306***	3.040***	2.976***	3.184***	3.241***	cluster
	(0.231)	(0.305)	(0.260)	(0.233)	(0.232)	
Decision change	Learning channels# c.Freq Images	Learning channels# c.Freq Sounds	Learning channels# c.Efimages Neg	Learning channels# c.Textimages Efneg	Learning channels# c.Timing Bef	
	0.0525**	0.0394**	0.0656***	0.0521***	0.0507***	robust
	(0.0160)	(0.0144)	(0.0135)	(0.0148)	(0.0132)	
	0.0525**	0.0394*	0.0656***	0.0521***	0.0507***	cluster
	(0.0165)	(0.0161)	(0.0120)	(0.0148)	(0.0103)	
Learning channels	0.686***	0.747***	0.644***	0.699***	0.697***	robust
	(0.0677)	(0.0567)	(0.0604)	(0.0618)	(0.0584)	
	0.686***	0.747***	0.644***	0.699***	0.697***	cluster
	(0.0663)	(0.0651)	(0.0555)	(0.0625)	(0.0506)	
N	426	426	423	423	424	

Standard errors in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Table 28: Integrated effect on decision Model 157

	(157)	cluster
Learning channels#c.Market	0.172*	0.172*
	(0.0866)	(0.0717)
	0.220	0.220**
	(0.155)	(0.0679)
	0.0917	0.0917
	(0.116)	(0.119)
	0.000198	0.000198
	(0.115)	(0.139)
Learning channels	2.762***	2.762***
	(0.322)	(0.221)
	2.563***	2.563***
	(0.568)	(0.237)
	3.149***	3.149***
	(0.422)	(0.457)
	3.327***	3.327***
	(0.409)	(0.450)
Decision		
Learning channels#c.Channel_Com Neg	-0.134*	-0.134*
	(0.0549)	(0.0577)
	-0.0967	-0.0967
	(0.0720)	(0.0903)
	0.0640	0.0640
	(0.0613)	(0.0717)
	-0.0401	-0.0401
	(0.0489)	(0.0936)
Learning channels	2.308***	2.308***
	(0.187)	(0.198)
	2.048***	2.048***
	(0.256)	(0.303)
	1.565***	1.565***
	(0.212)	(0.271)
	1.944***	1.944***
	(0.176)	(0.332)
N	408	408

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table 29: Moderated mediations differentiated between learning channels

Model 67

(Std. Err. adjusted for 14 clusters in Cla)

	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
Structural Channel_Com Posi <- Family						
Visualer	.2428425	.1536304	1.58	0.114	-.0582674	.5439525
Auditoree	.103211	.0432354	2.39	0.017	.0184712	.1879509
Hapticer	.3049002	.007951	38.35	0.000	.2893165	.3204838
Balanced	.2668428	.1434807	1.86	0.063	-.0143743	.5480599
_cons						
Visualer	2.210634	.7479431	2.96	0.003	.7446924	3.676575
Auditoree	3.020183	.2382704	12.68	0.000	2.553182	3.487185
Hapticer	2.058076	.0804717	25.58	0.000	1.900355	2.215798
Balanced	2.174373	.6360219	3.42	0.001	.9277925	3.420953
Decision change <- Channel_Com Posi						
Visualer	.1941959	.0321774	6.04	0.000	.1311293	.2572624
Auditoree	.1543765	.0612829	2.52	0.012	.0342643	.2744887
Hapticer	.05	.0186941	2.67	0.007	.0133603	.0866397
Balanced	.0473988	.0213132	2.22	0.026	.0056258	.0891719
_cons						
Visualer	.1691383	.118336	1.43	0.153	-.062796	.4010727
Auditoree	.3411271	.2571171	1.33	0.185	-.1628132	.8450674
Hapticer	.73125	.056471	12.95	0.000	.6205689	.8419311
Balanced	.7791908	.0721096	10.81	0.000	.6378585	.920523
var(e.medC_2)						
Visualer	.5360709	.0494157			.4474632	.6422248
Auditoree	.4585159	.0261677			.4099926	.5127821
Hapticer	.7069344	.0427856			.6278589	.795969
Balanced	.6868784	.0941981			.5249846	.8986966
var(e.dDC01)						
Visualer	.124498	.0064644			.1124513	.1378352
Auditoree	.0928022	.0232604			.0567818	.1516729
Hapticer	.083138	.0104623			.0649654	.106394
Balanced	.0529117	.0120721			.0338334	.082748

Model 108

(Std. Err. adjusted for 14 clusters in Cla)

	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
Structural Channel_Com Posi <- State						
Visualer	.3265373	.0641965	5.09	0.000	.2007144	.4523602
Auditoree	.2644628	.1100171	2.40	0.016	.0488333	.4800923
Hapticer	.0625	.0156457	3.99	0.000	.031835	.093165
Balanced	-.0778047	.1032708	-0.75	0.451	-.2802118	.1246023
_cons						
Visualer	1.964814	.2933736	6.70	0.000	1.389813	2.539816
Auditoree	2.342246	.4542936	5.16	0.000	1.451847	3.232645
Hapticer	3.234375	.1363559	23.72	0.000	2.967122	3.501628
Balanced	3.772384	.3528203	10.69	0.000	3.080869	4.463899
Decision change <- Channel_Com Posi						
Visualer	.1941959	.0321774	6.04	0.000	.1311293	.2572624
Auditoree	.1543765	.0612829	2.52	0.012	.0342643	.2744887
Hapticer	.05	.0186941	2.67	0.007	.0133603	.0866397
Balanced	.0473988	.0213132	2.22	0.026	.0056258	.0891719
_cons						
Visualer	.1691383	.118336	1.43	0.153	-.062796	.4010727
Auditoree	.3411271	.2571171	1.33	0.185	-.1628132	.8450674
Hapticer	.73125	.056471	12.95	0.000	.6205689	.8419311
Balanced	.7791908	.0721096	10.81	0.000	.6378585	.920523
var(e.medC_2)						
Visualer	.5065671	.0412415			.4318547	.5942051
Auditoree	.4219051	.0329876			.3619609	.4917767
Hapticer	.7265625	.0402988			.6517201	.8099997
Balanced	.7059017	.0731399			.5761686	.8648462
var(e.dDC01)						
Visualer	.124498	.0064644			.1124513	.1378352
Auditoree	.0928022	.0232604			.0567818	.1516729
Hapticer	.083138	.0104623			.0649654	.106394
Balanced	.0529117	.0120721			.0338334	.082748

Model 118

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
Structural						
Freg Imagsou <- State						
Visualer	.3503782	.1577297	2.22	0.026	.0412337	.6595227
Auditoree	.2818361	.0205272	13.73	0.000	.2416036	.3220686
Hapticer	-.0550605	.0334716	-1.64	0.100	-.1206636	.0105426
Balanced	.0892857	.0332683	2.68	0.007	.0240811	.1544903
_cons						
Visualer	2.46728	.7434594	3.32	0.001	1.010127	3.924434
Auditoree	2.770484	.0663023	41.79	0.000	2.640534	2.900434
Hapticer	4.172502	.1012356	41.22	0.000	3.974083	4.37092
Balanced	3.714286	.1279288	29.03	0.000	3.46355	3.965022
Decision change <- Freg Imagsou						
Visualer	.0693143	.0299687	2.31	0.021	.0105768	.1280518
Auditoree	.1249388	.0584592	2.14	0.033	.0103609	.2395168
Hapticer	.08975	.0284424	3.16	0.002	.0340039	.1454961
Balanced	.0244474	.0157114	1.56	0.120	-.0063464	.0552413
_cons						
Visualer	.5480196	.1285302	4.26	0.000	.296105	.7999342
Auditoree	.3797097	.2527817	1.50	0.133	-.1157334	.8751528
Hapticer	.53425	.1305633	4.09	0.000	.2783506	.7901494
Balanced	.8347846	.0632372	13.20	0.000	.710842	.9587271
var(e.medF_4)						
Visualer	.6105038	.0518299			.5169207	.7210291
Auditoree	.8232913	.0883616			.6671083	1.01604
Hapticer	.8310026	.0806063			.6871267	1.005004
Balanced	.5881243	.038124			.5179545	.6678003
var(e.dDC01)						
Visualer	.1421422	.0099116			.1239848	.1629588
Auditoree	.0913119	.0279157			.0501533	.1662475
Hapticer	.0929362	.0181712			.0633512	.1363374
Balanced	.0604565	.0166532			.0352349	.1037319

Model 126

(Std. Err. adjusted for 14 clusters in Cla)

	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
Structural						
Ef ImagSou Posi <- State						
Visualer	.1738281	.0506865	3.43	0.001	.0744843	.2731719
Auditoree	.3321816	.1215265	2.73	0.006	.0939941	.5703692
Hapticer	-.0562946	.0504669	-1.12	0.265	-.1552079	.0426187
Balanced	.0428571	.0098842	4.34	0.000	.0234844	.0622299
_cons						
Visualer	3.060872	.2525881	12.12	0.000	2.565809	3.555936
Auditoree	2.477295	.5978455	4.14	0.000	1.30554	3.649051
Hapticer	4.176671	.2613957	15.98	0.000	3.664345	4.688997
Balanced	3.742857	.0618542	60.51	0.000	3.621625	3.864089
Decision change <- Ef ImagSou Posi						
Visualer	.0615404	.035089	1.75	0.079	-.0072326	.1303135
Auditoree	.1340421	.0387436	3.46	0.001	.058106	.2099783
Hapticer	.1051229	.0517567	2.03	0.042	.0036816	.2065642
Balanced	.0180573	.0089508	2.02	0.044	.000514	.0356006
_cons						
Visualer	.5906335	.1490507	3.96	0.000	.2984995	.8827674
Auditoree	.3527625	.1783217	1.98	0.048	.0032583	.7022666
Hapticer	.4726088	.2267943	2.08	0.037	.0281002	.9171175
Balanced	.8640515	.0303414	28.48	0.000	.8045835	.9235194
var(e.medE_4)						
Visualer	.5253716	.0797691			.3901445	.7074695
Auditoree	.6830901	.1464862			.4486843	1.039956
Hapticer	.7157472	.1074859			.5332517	.9606985
Balanced	.6360046	.0909608			.4805319	.8417794
var(e.dDC01)						
Visualer	.1423365	.0149504			.1158537	.1748729
Auditoree	.0914635	.0234518			.0553342	.1511825
Hapticer	.0926095	.0176036			.0638052	.1344173
Balanced	.0606027	.0166394			.035382	.1038011

Model 132

Hoang Hue Chi, "How logical are your decisions?" *International Research Journal of Advanced Engineering and Science*, Volume 5, Issue 2, pp. 61-89, 2020.

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

(Std. Err. adjusted for 14 clusters in Cla)

	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
Structural						
Efimages Neg <- State						
Visualer	.4813084	.0476536	10.10	0.000	.387909	.5747078
Auditoree	.292695	.1116512	2.62	0.009	.0738626	.5115273
Hapticer	-.0033091	.0782367	-0.04	0.966	-.1566502	.1500321
Balanced	.0684416	.0751861	0.91	0.363	-.0789206	.2158037
_cons						
Visualer	1.551402	.2319015	6.69	0.000	1.096883	2.005921
Auditoree	2.413129	.4870167	4.95	0.000	1.458594	3.367665
Hapticer	3.659828	.3552583	10.30	0.000	2.963534	4.356121
Balanced	3.501681	.3191518	10.97	0.000	2.876155	4.127207
Decision change <- Efimages Neg						
Visualer	.0818997	.0169989	4.82	0.000	.0485826	.1152169
Auditoree	.0867415	.0345698	2.51	0.012	.018986	.154497
Hapticer	.0682353	.0160434	4.25	0.000	.0367908	.0996798
Balanced	.0244423	.010353	2.36	0.018	.0041509	.0447338
_cons						
Visualer	.5299828	.0597685	8.87	0.000	.4128388	.6471268
Auditoree	.5598022	.1383251	4.05	0.000	.28869	.8309144
Hapticer	.6470588	.0696085	9.30	0.000	.5106287	.783489
Balanced	.8498623	.0573048	14.83	0.000	.7375471	.9621776
var(e.medE_7)						
Visualer	1.013478	.0709981			.8834548	1.162638
Auditoree	1.326511	.1355299			1.085784	1.62061
Hapticer	1.291225	.0852814			1.134443	1.469675
Balanced	1.193373	.1567902			.922448	1.543869
var(e.dDC01)						
Visualer	.1359762	.0138406			.1113838	.1659984
Auditoree	.0945243	.0148232			.0695119	.128537
Hapticer	.0873039	.01182			.0669561	.1138354
Balanced	.0533706	.0155441			.0301571	.0944526

REFERENCES

[1] Alistair Mutch, 2018, Practice, Substance, and history: Reframing institutional logics, Academy of Management Review, Vol. 43, No. 2, 242–258. https://doi.org/10.5465/amr.2015.0303
[2] Atsushi, M. & Osamu, T. 2010. Comparing Frequency and Trueness Scale Descriptors in a Likert Scale Questionnaire on Language Learning Strategies, JLTA Journal, 12 (2010) pp. 116–136
[3] Bill Wooldridge, Birton Cowden, 2020, Strategic Decision-Making in Business, Subject: Business Policy and Strategy Online Publication Date: Jan 2020, DOI: 10.1093/acrefore/9780190224851.013.1 Access: 13 March 2020 7:13:45 PM
[4] Brown, S. 2010. Likert Scale Examples for Surveys, ANR Program Evaluation, Iowa State University Extension
[5] Burns, T. & Roszkowska, E..2016. Rational Choice Theory: Toward a Psychological, Social, and Material Contextualization of Human Choice Behavior. Theoretical Economics Letters, 2016, 6, 195-207 http://dx.doi.org/10.4236/tel.2016.62022
[6] Chang, L. & Krosnick, J.A. 2003. Measuring the frequency of regular behaviors: Comparing the 'typical week' and the 'past week'. Sociological Methodology, 33, 55-80.
[7] Corner, P.D., Kinicki, A.J., Keats, B.W.1994. Integrating Organizational and Individual Information Processing Perspectives on Choice, Organization Science, Vol.5, No.3 https://doi.org/10.1287/orsc.5.3.294
[8] Daft RL, & Weick KE. 1984. Toward a model of organizations as interpretation systems. Academy of Management Review 9(2)
[9] David, A.H. and Hock-Peng S., 2006, What is diversity and how should it be measured?, Sage publication
[10] Dollinger MJ. 1984. Environmental boundary spanning and information processing effects on organizational performance. Academy of Management Journal 27(2): 351–368.
[11] Goslar, Martin D., Green Gary I., Hughes Terry H. (1986). Applications and Implementation, Decision Support Systems: An Empirical Assessment for Decision Making, Decision Sciences, Vol 17
[12] Gregory Moorhead & Ricky W. Griffin, 2001, Organizational Behavior: Managing People and Organizations, Sixth Edition, 6th edition, Publisher: Houghton Mifflin Harcourt Kast & Rosenzweig, 1972

[13] Joshua R.Knapp, Thomas Dalziel. 2007. Agency theory and the effects of cognitive social categorization. Academy of Management. Published Online: 30 Nov 2017 https://doi.org/10.5465/ambpp.2007.26506659
[14] Kahneman, D. and Miller, D..1986. Norm theory: Comparing Reality to Its Alternatives. Psychological Review, 93, 136-153. http://dx.doi.org/10.1037/0033-295X.93.2.136
[15] Kahneman, D.,&Tversky, A. 1979. Prospect theory: An analysis of decision under risk. Econometrica, 47, 263–291.
[16] Kiss, Andreea N.; Barr, Pamela S. 2015. New venture strategic adaptation: The interplay of belief structures and industry context. Strategic Management Journal. Vol. 36 Issue 8, p1245-1263. DOI: 10.1002/smj.2285
[17] Lietz, P. 2010. Research into questionnaire design: A summary of the literature, International Journal of Market Research Vol. 52 Issue 2, The Market Research Society DOI: 10.2501/S147078530920120X
[18] M. Rozaidy, A. K. Siti-Nabiha, 2018, A framework on institutional entrepreneurships: The roles of logic and rhetorical institutionalism. The European Proceedings of Social & Behavioural Sciences (EpSBS), ICBSI 2018 International Conference on Business Sustainability and Innovation, ISSN: 2357-1330, https://doi.org/10.15405/epsbs.2019.08.21
[19] Michael A. Hogg, 2001, A Social Identity Theory of Leadership, Volume: 5 issue: 3, page(s): 184-200, https://doi.org/10.1207/S15327957PSPR0503_1
[20] O'Brien, L.1989. Learning Styles: Make the student aware. NASSP Bulletin
[21] Saunders, Lewis & Thornhill. 2016. Research methods for business students, 4th edition, Prentice Hall, Financial times
[22] Schneckenberg, D., Velamuri, V., & Comberg, C. (2019). The Design Logic of New Business Models: Unveiling Cognitive Foundations of Managerial Reasoning. European Management Review,16(2), 427-447.
[23] Seger, C.A. & Peterson, E. J. .2013. Categorization = Decision Making + Generalization, Neurosci Biobehav Rev. 37(7): 1187–1200. doi:10.1016/j.neubiorev.2013.03.015.
[24] STATA, Intro 4 - Substantive concepts, Intro 8 - Robust and clustered standard errors, stata.com, Statistics Data Analysis, StataCorp, 4905 Lakeway Drive, College Station, Texas 77845 USA
[25] Stephen A.Stumpf, Dale E.Zand, Richard D. Freedman, 1979, Designing Groups for Judgmental Decisions, Academy of Management Review, Vol. 4, No. 4, 589-600
[26] Thornton, P. H., & Ocasio, W. 1999. Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958–1990. American Journal of Sociology, 105:801–843.
[27] Thornton, P. H., & Ocasio, W. 2008. Institutional logics. In R. Greenwood, C. Oliver, R. Suddaby & K. Sahlin Andersson (Eds.), The Sage handbook of organizational institutionalism, London: Sage.Pache & Santos, 2013