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FUNCTIONS OF MODAL VERBS IN PAKISTANI RESEARCH DISCOURSE OF ECONOMICS AS AN ACADEMIC DISCIPLINE

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ABSTRACT

Academic discourse like argumentative writing is meant to build strong arguments while projecting different theories and research. In academics, writers are expected to express certainty and doubt. In this regard, a modal verb is used to reflect the speaker's perspective about anything obvious, tentative or reasonable. It improves language expressions to form accurate opinions, obligations, purposes and understanding of certain notions. Economic discourse through its representational nature caters selection and distribution of ideas and products by convincing the readers. All academic genres including thesis writing as selected for this study are also persuasive and structured to accommodate the reader's idea and agreement with the stated idea. Five PhD theses in Economics are selected to analyze the modal trends and their functions in Pakistani academic research discourse of social sciences exploring four major chapters of Introduction, Literature Review, Methodology and Discussion unveiling an intersubjective trend of discourse. Incorporating the Systemic Functional Linguistics model of contextual analysis (Halliday & Matthiessen, 2014), this study also focuses on these similar trends of locating the possibility and likelihood of commencement of events or ideas through the use of modal verbs by using Halliday's (2014) model of modality choices incorporating a third category of orientation by Lyons (1977) and Coates (1983) known as inter-subjectivity which makes the modalities more neutral and closely connecting writer with its audience. The results of the study uncover modulation patterns of inclinations and obligation in addition to the traditional pattern of modalization for proposing claims in academic discourse. The findings highlight how modal verbs in economic research discourse play a major role in putting forward the writer's propositions and implicitly invite readers for its validation and proposed

implementations through future actions. The research enlightens academicians specifically in the field of economic research about their written research discourse which is not simply about stating the facts but inviting, and sometimes manipulating the reader, regarding the writer's own proposed stance.

1. INTRODUCTION

Social science is a diversified form of science addressing society in its holistic form. It has been dwelling on its dual interests of knowing the world and bringing reforms to it (Lepenies, 1999 & Leonard, 2007). Since it is concerned with the systematic study of society and its institutions, and the way people behave as an individual and as a group within society, it is difficult to approach social sciences scientifically as argued by Gareau (1987). Many social scientists have themselves criticized this trend of objectivity or stating facts making it non-desirable for social sciences. Smith (1976) condemned this norm by saying that social scientists then treat people as objects limiting their understanding and applying narrowly structured disciplinary inquiries.

Academic discourse is linked with vast domains of using language in academic setups. It fosters research findings informing teaching and knowledge-making practices in different disciplines. All academic genres are persuasive and structured to accommodate the reader's agreement. Academic persuasion involves interpersonal negotiation containing ideas propagated to convince the readers. Economic academic discourse as selected for the study is also looked upon from subjective and persuasive point of view despite its scientific nature. Such academic discourse is practiced through different academic genres like research articles, dissertations (Bunton, 2002), conference presentations (Carter-Thomas & Rowley-Jolivet, 2001) and grant proposals (Connor & Upton, 2004). Successful academic writing highly depends on the writer's control of epistemic traditions of a particular discipline. This language variation and peculiarity across disciplines leads to dominant research in English for Academic Purposes (EAP) (e.g. Hyland, 2004b; Hyland & Bondi, 2006). Discipline is defined as norms and rhetorical practices experienced by a set of social communities (Hyland, 2009). Additionally, it projects the writer's shared professional context linking text, writers and readers together. Every discipline carries unique features, like sciences involving experimental proofs highlighting a gap in knowledge through a hypothesis and then supporting it with experimental findings. Humanities on the other hand enlighten narratives and case studies by building strong arguments. Social sciences fall between these two domains by applying scientific methods to human data and coming up with some more explicit interpretations. Thus, academic discourse defines the identity of a discipline and analysis of the text reveals distinctive ways disciplines offer to ask questions, address literature, and present and criticize ideas (Hyland, 2011).

In academic discourse, mood and modality have been considered fundamental areas of grammar. Modality as a form of linguistics analysis is associated with possibility, necessity, permission, prohibition, subjective or speaker orientation. It is further located in two domains: Epistemic – the probability of affairs and Deontic – the moral desirability of action (Nuyts, 2005). Modality is an ignored yet important semantic aspect of language that is significant to be explored

specifically in academic texts because it impacts the text massively as it can change the degree of truth and the meaning potential of a sentence depending upon the modality markers used in the text (Pionery & Isti'annah, 2017). Secondly, through modality, we can explore the attitudes of writers like demanding or suggesting various ideas which are significant concerning disciplinary variations in academic research discourse. Through this, we can analyze an overall ideology and implicit meaning present in the mind of the writer which could probably influence the opinion of the writer (Logogye, 2016). This study also focuses on exploring the interpersonal meaning of modality which could shape the writer's views and ideas in Pakistani written academic discourse of PhD thesis in the economics discipline using corpus methodology.

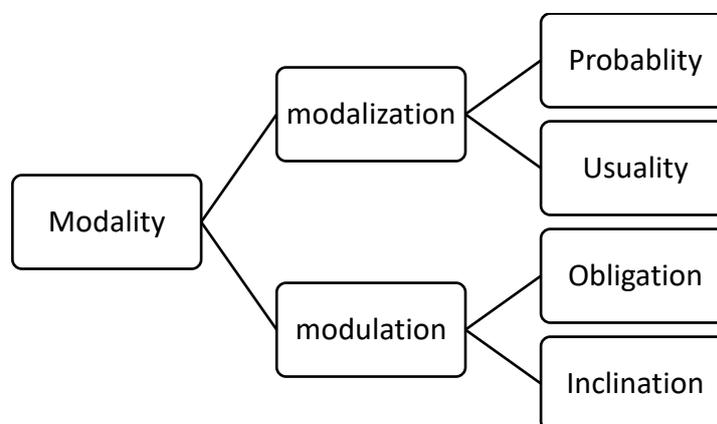
1.1 The Concept of Modality

Modality exists at very different grammatical levels in a language: lexical, morphological, syntactic or through intonation. These categories do not work autonomously but regulate under formal distinctions present in languages, route to language change and cross-language patterns of form and function (Bybee & Fleischman, 1995). Modal verbs may also function like hedges in academic circumstances (Vazquez & Giner, 2008). Hedges are defined by Lakoff (1973) as expressions which involve uncertainty, tentativeness and possibility. Likewise, modality according to Huddleston and Pullum (2002: 173) refers to the speaker's attitude towards facts i.e. driving the information towards necessity and possibility.

The concept of modality has been rooted in modal logic (branch of philosophy of language) and further categorized into two types: Epistemic and Deontic Modality. Epistemic modality is concerned with the possibility or necessity of truth of proposition embedded in knowledge and belief, e.g. 'if you are interested in studying the mind, lectures in Linguistics should prove interesting' while deontic modality deals with the necessity or possibility of acts executed by responsible agents thus linking them with the function of permission and obligation, e.g. 'Full credit should be given to the city authorities for having done so much for the environment' (Lyons 1977: 823). Halliday (2004) has also discussed these categories in terms of modalization and modulation as shown in figure 1. The modality that deals with the validity of information are modalization while the modality dealing with the willingness of the speaker and showing responsibility to the hearer or reader is modulation. He then extended these two categories into four types as the probability (maybe), usuality (sometimes), obligation (must be), and inclination (want to or can), where probability and usuality are grouped as modalization, while obligation and inclination are grouped as modulation. When a speaker gives his opinion on the likelihood that something will occur, it is called probability. It has the significance of perhaps yes or no. The term usuality, on the other hand, happens when a speaker conveys his assessment of how often something happens. It has the connotation of sometimes yes or no. On the other hand, modulation's inclination reflects the capability and tendency of a speaker to do something e.g. 'I need to do it again', while obligation refers to a speaker giving a command, suggestion, demand and advice to the listener, e.g. 'You should have read the

fine print'. In addition to this, two other related aspects of modality, orientation and value of modality, were also proposed where orientation is reflecting modality as subjective or objective having opinion holder presence and as explicit or implicit expressing salient expression of modality (Halliday and Matthiessen, 2004).

Figure 1 System of Types of Modality (Halliday and Matthiessen, 2004)



Halliday (2000) has recognized modality as an important part of the language because it is related to one of the three metafunctions of language, i.e. ideational, textual and interpersonal. Simpson (1993) also proposed his point that modality is an important means of expressing interpersonal meaning. Interpersonal rhetorical features have a significant role in academic writing, therefore researchers interested in the rhetoric of academic writing are keen to know how writers employ this interactive feature to attain persuasion, acceptance and endorsement by the readers. The awareness of these rhetorical devices is important in scholarly communication because in academic writing the writer is not simply supposed to state the facts or reality of the world but should be engaging with the readers, specifically his peers and members of his discourse community (Hyland, 2004). This study will highlight disciplinary patterns of modalities and genre-specific orientation concerning modalities and the writer's knowledge of modalities in academic discourse needed to build academic arguments concerning economics discipline.

Modality is categorized as more than just having modal auxiliaries such as may, might, can, could, will, would, shall, should, must, and ought. Instead, it also concerns the speaker's attitude towards the proposition. It refers to the orientation of meaning concerning modality. For this sake modality is again divided into subjective and objective modalities. Subjectivity is defined as the expression of self and representation of the speaker's intention or idea in discourse. It is usually expressed by first person pronoun (Finegan, 1995). Objective modality expresses personal opinion by using third person or impersonal *it*. Inter-subjectivity is however a new concept linked with modality merging the categorized concept of objective and subjective modality as proposed by Lyons (1977) and Coates (1983). Nuyts (2012) while introducing the concept of inter-subjectivity argued that objectivity is not an appropriate term used for the description of modal categories because modal categories refer to the speaker's attitudes. However, linking modality with objectivity also lacks

empirical evidence. While inter-subjectivity is carrying responsibility for modal qualification stating responsibility to be shared between the speaker and a large group of people.

Narrog (2012) also added another wider aspect to inter-subjectivity related to the speaker's attention to the self-image of the addressee naming various linguistic expressions like modal markers, discourse markers, and politeness strategies as inter-subjective markers. This framework is used in diachronic studies where expressions have subjective meaning (speaker's attitude) and intersubjective meaning towards the addressee and speaker's attitude. He terms the concept as a linguistic expression usually correlated with use or context, thus every modal marker is associated with its speech acts.

A modal verb is an important hedging tool in academic writing. Hedges are the uncertainty markers that usually writers use to soften their content. Pakistani researchers have thoroughly and deeply explored these markers in different academic and non-academic domains. Raza (2018) explored hedges as metadiscourse markers in Pakistani English Newspaper Editorials (PENE). He compared modal frequencies based on propositional and non-propositional materials and categorized the proposed model into an expression of uncertainty, conditional clauses, interpersonal expressions and reported speech. Abbas and Shehzad (2018) have also explored the pragmatics of hedges and boosters as metadiscourse markers in the final investigation report of the joint investigation team of the Panama case in Pakistan in 2017. It witnessed the prototypicality of hedging and boosting indicating specific genre features of investigation reports. This prototypical feature determines investigation reports as a quasi-legal genre. Likewise, Batool et.al (2019) conducted a corpus-based study on hedges and boosters in Pakistani opinion articles. The study focused on the stance built by the writers through these lexical markers. It concludes that hedges are used to reflect their cautious writing portraying the uncertainty of the writer and concealing their position, while boosters are used to show a solid viewpoint and to persuade the readers about the writer's opinion. Rashid et.al (2020) have explored the frequency of metadiscourse markers in the opinion section of Pakistani and American Newspapers using corpus linguistics. It explored two interpersonal functions of hedging and boosters concluding that the American opinion section uses more metadiscourse markers than Pakistani newspapers. It also revealed that writer use hedges to convey doubt and uncertainty while boosters are used when writing about facts that make writing more assertive and reflect confidence. This study intends to explore the use of modality markers in the realm of academic discourse which has great potential for research due to its obvious practical ELT applications.

1.2. Academic Research Discourse and its Features

Discourse analysis and Corpus Linguistics are quite closely related to each other as they tend to explore recurring patterns in naturally occurring discourse. Both fields can be used to study the ideological and social context of the discourse, where discourse analysis specifically deals with the structural patterns rooted in cultural context while corpus linguistics utilizes the techniques that decontextualize individual texts (Charles, Pecorari & Hunston, 2009).

According to Swales (2002), discourse analysis of academic writing can be classified into two categories: one interpreting writing as a social practice, considering not only the effect of social role on the text but also the role of writer and text in formulating their context. The second feature is the recurring pattern of meaning in texts of similar nature, usually named 'generic elements and 'moves'. This study focuses on the first prevailing feature of academic discourse targeting thesis writing as a part of Pakistani academic research discourse.

The research in thesis writing as a genre is ironically being neglected due to its linguistic and rhetorical complexities despite doctoral students needing help in well-theorized material and writing (Kamler and Thomson, 2006). Although some of the learning advisers started providing general help to doctorate students specifically concerning this concept of 'genre' (a category, type, or family) and 'generic' (ambiguously both 'of a category and 'non-specific') nature of discourse. But for the sake of analysis, literary studies academics split works into genres. It's useful to think of a PhD thesis as a literary genre and talk about generic writing support in this situation from a theoretical standpoint. Writing assistance for PhD studies may be conceptualized and theorized in a variety of ways to supplement the writing. Within disciplines, supervisory help is available. Observations on the social relevance of Doctoral writing, which is also socially situated, lend themselves nicely to the genre and then return to the discourse that generates it. The use of generic learning assistance is a helpful yet contentious term in higher education (Carter, 2011).

The generic analysis combines various texts with their shared communicative purposes to analyze them into stages which may overlap in their comprehension and analysis of their macrostructure. It assumes that every section of a genre conveys an accurate indication of the overall communicative purpose divided into different parts which reflect their respective structures (Starfield & Ravelli, 2006). In the thesis writing genre, its textual features determine the shape of the genre. The genre has several responsibilities, including filling a gap in existing knowledge, providing a unique contribution that is accepted by its community, exhibiting a globally recognized level of presentation, and transitioning its author from a novice to a licensed practitioner. It also weaves its author's social identity into the fabric of literature, while weaving new information into the literary background. Each PhD thesis is shaped by the discourse it inherits and a product of literature from which it is produced. It is even more obvious that the research thesis is a genre that necessitates this intertwining, and insists on the demonstration of this knowledge (Helgerson, 1992, p. 13).

Halliday's (1978) and Giddens' (1984) theories are based on the social context surrounding the production of academic discourse, making it a social practice shaped by the community's expectations and practices. Integrating Systemic Functional Linguistics (SFL) in academic discourse focuses on genre and its social context based on in-depth linguistics analysis. It is a theoretical approach that analyzes linguistic aspects within social contexts. It takes language as a functional and meaning-making tool, referring to language attitudes related to

people, how language is structured for a particular context and how people are using it (Halliday & Matthiessen, 2014).

Thesis or Dissertation writing is an enriched and most extensive genre of academic discourse. It unfolds a topic into multi-layered knowledge domains covered in different chapters of the thesis. Five chapters are included in the structure of a thesis including the introduction, literature review, methodology and findings or conclusion (College of Education Masters Committee, n.d.). The first chapter of the introduction is a non-narrative chapter which includes answers to the basic questions related to the study including a statement of the problem, the significance of the study, research questions, limitations, assumptions, keywords and concepts. It helps the reader to identify what will be the study about and why the study has been conducted (McMillan & Schumacher, 2010). The second chapter of the literature review highlights the previously conducted studies related to the selected topic or theme. It establishes the stance for the distinctiveness of a thesis being the logical expansion of previous works. The methodology is the third chapter of a thesis which enlists data, tools, data collection and data analysis procedures. It helps to evaluate the validity and appropriateness of the study. The discussion chapter of findings is the most important chapter of a thesis as it reflects the actual analysis of data being carried out during the research and it leads us to the conclusion and future recommendations of the research. Summary of the results can be displayed in the form of tables, charts or graphs. The potential implications and facts explaining how the findings confirm or diverge from previous findings are also part of this section (College of Education Masters Committee, n.d.).

1.3. Economics Discourse

Economics talks about the economy or uses language to describe, interpret and explain the economy. According to McCloskey (1983), it is more of a system of metaphors within their respective mode of discourse. As a language, economics is part of the total communication system of society and partly it belongs to the total symbolic, myth and code system of society that governs meaning and signification. It is loaded with preconceptions and presuppositions of substantive and structural variety (Samuels, 1990).

Economic discourse is viewed in scientific literature as a process of text creation in connection with sociocultural, psychological, and pragmatic aspects. Additionally, it is a deliberate social activity that incorporates people's interaction and cognitive processes being observed in the community. Furthermore, it is described as a collection of speech activities that are related to the economy and written materials that represent the economic world. Therefore, economic speech is distinguished by extra linguistic characteristics present, as well as characteristics of economics text. Due to the international economic market and globalization of economics, the language of economics serves the basic purpose of helping and communicating with underdeveloped countries and for this reason, the language structure needs to be studied to have a true insight of meaning into the language (Zaykova, 2018).

Little is known about the features of economics academic discourse specifically about the use of modality. In view of previous research, modal auxiliary verbs function as a means of expressing hedging in academic discourse that contributes to a disciplinary variation where linguistics and economics have a higher frequency than engineering and natural sciences while medicine involves a medium level of modality (Hardjanto, 2016). In light of this claim and a lack of substantial research to highlight the use of modality in Pakistani economics research discourse, this research is carried out to fill the gap and bring Pakistani academic English variety to the forefront. Therefore, this study explores four sections of thesis writing based on the basic organizational structure of scientific research writing (IMRaD) first used by Louis Pasteur in 1876 with respect to disciplinary differences of modality explaining the nature of information being distributed in four different sections of academic research discourse like PhD thesis writing in the discipline of economics.

2. METHODOLOGY

Modality is analyzed through one of the very dense and extensive genres of Pakistani Academic writing i.e. PhD theses. The reason for choosing this genre is to ensure that this form of academic writing will be complete and effective in its modal structures and the writers will be at an advanced level in the English language. Five theses have been selected as a sample from HEC's Pakistan Research Repository (PRR) to overview the trend and lexical patterns of modality in the research discourse of Economics. The selected time slot for these theses is from 2015-2020. However, it was preferred to select the latest published thesis.

Since the study is corpus-based and is using corpus methodology, so all the selected theses are converted into text files categorized in terms of four main chapters based on the basic structure of scientific writing (IMRaD) introduced by Louis Paster in 1876 including Introduction, Methodology, Results and Discussion or Findings (if discussion chapter is not included as a part of the thesis) while excluding all cover pages, abstract, acknowledgements, table of contents, conclusion and list of references. However, Literature Review has been included exclusively as a part of the study as it is an extension of the introduction chapter as observed in the Pakistani theses and constitutes the major chunk of research writing. Corpus size is relatively defined for each chapter's text file in consolidated data based on different types and tokens present in each file. Text files for all these theses are created and analysis has been done through concordance lines and selected keywords of modal verbs for each chapter of the thesis. The concordance lines of each keyword are also categorized into modality types: Modalization (Epistemic) and Modulation (Deontic). It also explores values of modality in terms of Probability, Usuality, Obligation and inclination while the orientation of modality is looked at in terms of Subjectivity or Objectivity adopted from Halliday and Matthiessen's (2004) model of modality choices incorporating a third category of orientation by Lyons (1977) and Coates (1983) known as inter-subjectivity which makes the modalities more neutral and closely connecting the writer with its audience. Modal verbs including can, could, dare, may, might, must, need, ought, shall, should, will, and would are used as keywords to study the modal behavior of auxiliaries following Quirk et al. (1985) and Downing and Locke (1992). The

following corpus size as depicted in Table 1 has been evaluated for modalities across economics discourse.

Table 1 Corpus size of Economics' Research Academic Discourse

S. No.	Subject	Chapter	Total size	Tokens	Type
1	Economics	Introduction	162,179	24695	3200
		Literature Review	448757	67278	5790
		Methodology	34615	5221	907
		Discussion/Findings	225505	35472	2280

3. DATA ANALYSIS

Overall, economics as a subject caters to two kinds of discourse: one is known as official and unofficial, while the other is explicit and implicit (McCloskey, 1986, p.5) The official and explicit reflects scientific methodology and rhetorical discourse based on the hypothetical and deductive model of science (1983, p.484), while the unofficial and implicit method uses economic metaphors, the relevance of historical models and researches, power of authority, the charm of symmetry, claims of morality and persuasive attitude of self-analyses. Interestingly, writers follow unofficial and implicit rhetoric of economics to convey the idea and convince readers about the hypothetical view (op. cit: p.482).

3.1. Introduction Section

The introduction of a thesis is meant to explain the significance of the study and its objective in the first chapter. The relevance of the study is discussed by examining how it contributes to the field's theoretical body of knowledge as well as its practical implications for communication professionals in the field under consideration (Hon, 2007). Modal verbs as used in this chapter help to put forward writer's stance with multiple modal categories pertaining to various functions. Occurrences of modal categories are reflected in Table 2.

A) *Can/Could*

Can is the most frequently occurring modal verb in the introduction chapters of economics.

E-1 The internal management can design acquisition to reduce the costly income volatility as results of the study guide the decrease in income volatility and increase in operational hedging through acquisition. (Probability/Explicit/Objective)

The essence of this modal verb is close to epistemic possibility or probability but it is closer to theoretical possibility; here the writer reports the state of fact and draws conclusions on the basis of experiments or observations.

E-2 hence we can provide the results for only those strategies in isolation and of those combinations where there are enough observation to regress model (Inclination/Explicit/Subjective)

E-3 They can assess various financial variables and can ensure the good governance practices as antitakeover tactic.

Subjective modality has been expressed clearly by using first person pronouns in E-2 while objective modality is depicted through using third person pronouns in E-3. Epistemic can refer to present and sometimes as ‘may’ it refers to future situations as well. ‘Can’ also depicts the potential occurrence of the situation which is why it shares semantic closeness with the modal verb ‘may’.

E-4 Synergy in firms operations can help in realizing economies of scope and scale (Future/implicit/intersubjective/usuality).

Deontic meanings of *may* and *can* are however distinctive in the sense stated by Vanparys (1987, p.232). *May* refers to subjective meaning while *can* refers to objective meaning; *may* reflect granting permission while *can* reflects the condition that someone has the permission. That is, *may* involve external permission while *can* intrinsically own permission. Thus, deontic *can* inherently and naturally owns a place, thing or person so it is clearly an objective description.

E-5 In order to achieve this objective, we have constructed Household Adaptive Capacity Index (HACI) so that we can provide evidence on the adaptive capacity of farm households of Pakistan. (Objective/ obligatory/ explicit)

E-6The issue of gender inequality can be thought of as a common characteristic of developing countries. (inter-subjective/ Inclination/ explicit)

Like *may* and *can*, *could* and *might* share semantic properties with each other in epistemic domains. Both of them belong to unreal situations, not necessarily reflecting any explicit condition. *Could* temporally cover all the three time domains of the present, past and future conveying a higher degree of possibility than *might*, as depicted in the given examples.

E-7 Vulnerability could be influenced by both monetary and non-monetary socio-economic, institutional and political factors, where non-monetary aspects have the potential to reduce vulnerability by enhancing the adaptive capacity of rural households. (present/usuality/Explicit/Objective)

E-8 According to Wadley (1988), a woman in India could not do anything independently in her own house; no matter she was a young girl or an elderly woman. (Past and Future/usuality/Objective)

B) *May/ Might*

Among many modal verbs used for the explanation of ideas in the introduction of academic writing, *may* is the second most frequently occurring modal verb in the introduction chapter of the economics theses with a total of 44 hits.

Deontic *may* as exclaimed by Leech (2003) is prototypically subjective; it only exists objectively in statements of rules, and administrative and legal/bureaucratic writing. However, it is observed that when *may* in epistemic sense exists with pronouns, it gives a sense of possibility while other than that it gives a sense of inclination in the text. It is generally observed for most epistemic modal verbs are usually linked with the verb *be* followed by stative verbs and inanimate subjects in both spoken and written texts (Coates, 1983). However, Economics writers relate more to the use of epistemic *may* with *be* in order to express speculation over a cause (Ngula, 2017)

E-9 We may find heterogeneity and differences in terms of social position, economic progress, rural-urban duality etc. in Pakistan (Probability /Explicit/ Subjective)

E-10 Acquisition decision may be derived from a series of complex motives which cannot be explained by a single approach (Probability/Implicit/intersubjective)

Subjective modality is expressed in the above-mentioned example by using first person pronouns; *We* reflects the personal judgment of the writer. Objective modality is however expressed in the third person *They* or impersonal *it*, as depicted in E-11. Modality can also be practiced explicitly like in the given example E-9, 11 where the speaker is overtly presenting the idea through modal verbs, while example E-10, 12 presents the covert ideas (Suhadi, 2011).

E-11 They may engage in enjoying more perquisites and engage in negative NPV (Net Present Value) projects as this high risk borne by shareholders. (Inclination/Explicit/ Objective)

E-12 Climate changes not only likely to result in significant yield variability in many regions of the world, it may also lead to the escalation of prices and hunger among poorest nations.

(Obligation/implicit/intersubjective)

It is usually observed that epistemic usuality is preceded by epistemic probability complementing each other in terms of validating and linking the aforementioned ideas.

In comparison with *may*, *might* has minimal existence with only two occurrences in the first chapter of the introduction. One example expresses objective explicit modality stating factual information based on research as in E-14, while the other example reflects the inter-subjective attitude of the author as in E-13.

E-13 This might be due to lack of research on women's involvement in livestock farming and their contribution towards the welfare of their families. (intersubjective/ Probability/explicit)

E-14 Some of the recent research in this regard showed that remittances might not be invested in a productive way but they still can generate an important multiplier effect. (Objective/ Inclination/explicit)

Table 2 Modal Categories in the Introduction Chapter of Economics

S.No	Model markers	Hits	Modalization		Modulation		Subjectivity-inter-subjectivity/ Objectivity
			Probability	Usuality	Obligation	Inclination	
1	May	42	18	14	7	3	2-Sub, 8-Obj, 32-inter-sub
2	Might	2	1	-	-	1	0-Sub, 1-Obj, 1-inter-sub
3	Should	3	-	-	3	-	0-Sub, 0- Obj, 3-inter-sub
4	Shall	1	1	-	-	-	0-Sub, 0-Obj, 1-inter-sub
5	Must	2	-	-	1	1	0-Sub, 0-Obj, 2-inter-sub
6	Can	43	20	13	2	8	3-Sub, 3-Obj, 37-inter-sub
7	Could	14	6	8	-	-	0-Sub,4-Obj,10-inter-sub
8	Would	7	3	3	-	1	0-Sub, 2-Objective,inter-sub-5
9	Will	19	13	3	2	1	2-Sub, Obj-0, 17-inter-sub

C) *Will/Would*

Another frequently occurring modal verb is *will* which is mostly regarded as epistemic, referring to present and past situations. It refers to predictability conveying the speaker's confidence in the truth of the proposition based on evidence of the previously mentioned situation. It mostly refers to subjective modality occasionally taking modality objectively. Predictability of *will* is semantically more strong than *must*. Out of 19 concordance lines, 16 are categorized as epistemic while 3 have the tendency of practicing deontic modality. Among these, mostly one sentence constitutes more than one modal verb 'will' followed by infinitives or a *to* clause in order to make the argument stronger. The first-person pronoun 'we' has been used in 2 examples followed by an infinitive to reflect the personal judgment of the writer as shown below.

E-15 By understanding the factors that are responsible for the differences among the adaptive capacity of farm households, we will be able to target the areas where most of the policy efforts are required to enhance the capacity to adapt the changing climatic conditions. (Usuality/explicit/subjective)

E-16 The aim of this will be to improve capabilities of our livestock and use it like an engine for economic growth and food security inside the country which

will lead to empower the rural people and socioeconomic improvement. (Inclination/ Implicit/intersubjectivity)

E-17 The remittance will reach to US\$ 610 billion in 2016 and will further increase up to US\$ 636 billion in the year 2017 (Probability/Explicit/intersubjective) *Would* is used simultaneously to convey volition and propensity but comparatively less frequent than *will*. *Would* is used in a tentative form showing less level of speaker's confidence (Collins, 2009).

E-18 Human beings are vulnerable to climate to the degree they can be harmed; the higher the ability to face the climate stress they have, the lesser they would be harmed by it (Rayner and Malone, 2001) (Implicit/probability/inter-subjective).

E-19 Without foreign remittances, it would be very difficult to fulfill the huge gape of trade deficit. (Explicit/usuality/Objective)

D) *Must/Should*

Must and *should* are a deontic set of modals used to reflect obligation and necessity. It can also reflect strong directives by the speaker or needing compliance by the listener. *Must* typically exists as an objective deontic in formal, official documents by a person in authority. Subjective deontic cases are the pronoun 'you' while objective deontic cases are the third person. *Should* is usually taken in deontic meaning. It reflects the desirability of action driven by the speaker or the action needed to be performed as a result of moral or legal obligation. In the given text, *should* exists with common nouns reflecting the inter-subjectivity of the author.

E-20 Breton (2013) proposes that in order to create human capital, a country should provide the children (both male and female) with primary and secondary schooling by learning a lesson from the history of highly advanced countries, which provided free or at least highly subsidized education to the poor children. (Obligation-Implicit-Intersubjective)

Besides these commonly occurring modal verbs, usuality and possibilities are depicted through adverbs like usually, sometimes and always.

E-21 migration is always considered as a necessary element for socio-economic development of poor families all over the world, especially for developing nations. (usuality-Explicit-Objective)

E-22 Women living in developing economies are usually tacit and their voice has been hushed due to the inherent economic and cultural factors. (usuality-implicit-objective)

E-23 Sometimes, people migrate due to natural reasons or some personal objectives and causes (usuality-implicit-objective)

3.2. Literature Review Section

The literature review is the second chapter written in a thesis where previous studies and research relevant to the field are mentioned. It usually incorporates the proposed answers to the research questions put forward for the study. It allows the writer to know about the topic, verify assumptions and identify research gaps. For the discourse community, it also validates your knowledge about your topic (Feak and Swales, 2009). The nature of this chapter closely correlates with functions performed by modal verbs and hence having the most frequent occurrences in this chapter as shown in Table 3.

A) *May/Might*

Like the introduction chapter of the economics theses, *may* is also the second most frequently occurring modal verb in the literature review. Out of 99 hits, three times *may* exists as a noun. Epistemic *may* occurs mostly with a third person and first pronouns reflecting subjectivity, objectivity and inter-subjectivity. *It* is reflecting objective opinion while the modal verb *we* is reflecting subjectivity.

E-23 On basis of previous studies, we may hypothesize that Hypothesis 18: There has been a significant change in pre-vs. Post-acquisition cost efficiency of acquiring firms. (Subjective/Explicit/inclination)

E-25 They may devise antitakeover defenses in form of poison pills and other strategies that make the target firm less attractive (Objective/explicit/inclination)

E-26 It may also bring more market power and overconfident managers leading towards inefficient firm (Shepherd, 1986). (Probability/implicit/Objective)

Approximately 50% of the occurrences of *may* in the literature review chapter of the thesis are succeeded by the verb *be* as shown in the example below.

E-27 The term achievements may be misleading because it suggests increase in the welfare of women (usuality/inter-subjective/implicit)

E-28 Presence of free cash flows may give more power in the hands of 32managers so they may choose poor economic decision by accepting low NPV projects (Jensen, 1986) (probability-explicit/inter-subjective)

Subjective orientation in a text involves the writer's overt behavior about the utterance and self attributes the writer with the claims. Objective orientation however involves concealing the identity of the source. Similarly, the implicit and explicit value of modality is relatively defined in terms of clause distribution of modal truth. Implicitness is determined by the maintenance of modal elements within the same clause while explicitness is determined when modality extends actual facts beyond the limits of the clause into its own clause (Halliday & Matthiessen, 2004, pp.181).

Table 3 Modal Categories in Literature Review Chapter of Economics

S.No	Model marker	Hits	Modalization		Modulation		Subjectivity- Inter-subjectivity/ Objectivity
			Probability	Usuality	Obligation	Inclination	
1	May	99-3(N)	42	30	4	20	2-Sub, 23-Obj, 71-Inter-sub
2	Might	33	16	9	1	7	0-Sub, 3-Obj,30-Inter-sub
3	Should	40	10	-	30	-	7-Obj,1-Sub, 32-Inter-sub
4	Shall	0	-	-	-	-	-
5	Must	9	-	-	7	2	9-Inter-sub
6	Can	115	70	23	4	18	4-Sub, 13-Obj, 98-Inter-sub
7	Could	55	25	30	-	-	7-Obj, 48-Inter-sub
8	Would	37	22	13	-	2	8-Obj, 29-Inter-sub
9	Will	36	23	10	2	1	10-Obj, 26-Inter-sub

In comparison with *may*, *might* has less existence in literature review with 33 occurrences. Three examples express objective explicit modality stating factual information based on research while another example reflects the inter-subjective attitude of the author. Fourteen occurrences of *might* are followed by the verb *be*. Unlike the introduction chapter of economics theses, the second chapter reveals occurrences in all of four modal categories. Most commonly it is reflecting epistemic modalities with sixteen possibilities and nine usual modalities. Eight occurrences are deontic in nature with seven ideas of inclination and one as an obligatory modality.

E-29 Swain and Wallentin noted that it might be due to the fact that some of the factors took a considerably lengthier time to show their impact on women's empowerment. (Objective/explicit/ Probability)

E-30 Son preference, in other words, might be taken as preference of male, where higher value was attached with sons even as compared to older members. (Inter-subjective/implicit/usuality)

B) Will/Would

Modal verb *will* is mostly regarded as epistemic referring to present and past situations. It refers to predictability conveying the speaker's confidence in the truth of the proposition based on evidence of the previously mentioned situation. It mostly refers to subjective modality occasionally taking modality objectively. Predictability of *will* is semantically more strong than *must*. Among these, mostly one sentence constitutes more than one modal verb 'will' followed by

infinitives or *to* clauses in order to validate the argument. Third person pronoun is frequently occurring in the text referring to objective realities.

E-31 If irrigation is more than required for the plant, it will depress plant yield by creating waterlogging, lodging of crop and salinity problem (Chandiposha 2013). (Objective/usuality/Explicit)

E-32 Climate change raises serious concerns on gender dimension that is hard to ignore as women will be most exposed to irreversible losses resulted from climate change (Intersubjective/Implicit/Probability)

Would is also used simultaneously to reflect semantic domains of preferences and choices followed by verb *be* as shown in the examples given below.

E-33 Such status of women entrapped them in marital difficulties since earning of incomes would be perceived as a threat to the balance of power within the families. (intersubjective/implicit/usuality)

E-34 Women, who attain higher level of education and are employed, belong to upper class, and have exposure to mass media would have comparatively greater decision making authority (Ethiopian Democratic and Health Survey, 2005). (inter-subjective/Implicit/probability)

C) *Must/Should*

Deontic sets of modals like *must* and *should* are used to reflect obligation and necessity. It can also reflect strong directives by the speaker or needing compliance by the listener. *Must* typically exists as an objective deontic in formal, official documents by a person in authority. Subjective deontic cases are the pronoun *you*, while objective deontic cases are the third person. *Should* is usually taken in deontic meaning. It reflects the desirability of action driven by the speaker or the action needed to be performed as a result of moral or legal obligation. In the given text, *should* exists with common nouns reflecting the inter-subjectivity of the author. However, its counter modal verb *shall* is totally absent in literature reviews.

E-35 Word ‘agency’ in the perspective of women’s empowerment means women themselves must be substantial performer in the progression of change and not the recipients that are being quantified. (Obligation/inter-subjective/Explicit)

E-36 Stromquist (1995) emphasized the need to use psychological dimension along with other dimensions, to measure empowerment by maintaining that empowerment was a socio-political notion that must consist of cognitive, economic, psychological, and political constituents. (inclination/Inter-subjective/explicit)

For stressing a reality or situation, *should* is successively used to explicitly stress the idea and make it an obligatory statement elevating the semantic notion.

E-37 The expansion in people's choices also refers to the choices of women to pass their lives according their own free will that they should be treated on equal grounds to their male counterparts, they should be given equal opportunities to get education and paid jobs; they should be free to control their resources, they should be free to select their life partners, and their social mobility should not be banned (Kabeer, 2001). (Obligatory/ Explicit/Objective)

D) *Can/Could*

Like the introduction chapter, *can* is the most frequently occurring modal verb in literature review chapters of economics. The essence of this modal verb is close to epistemic possibility or probability but it is more close to theoretical possibility; here the writer reports the state of facts and draws conclusions on the basis of experiments or observations. Subjectivity has been reflected by using the first person pronoun *we*.

E-38 At present we can find a diversity of measures of empowerment developed in Asia to ascertain the determinants of women's empowerment and the role of women's empowerment in various outcome behaviors (Subjective/probability/explicit)

E-39 These capital gains can be attributed to signalling effect about future prospects of new firm (information hypothesis) or expected synergy benefits (synergy hypothesis). (Intersubjective/Implicit/Usuality)

Can and *could* is also used in the deontic sense like giving permission or allowing some action. It is followed by the verb *be* and the first form of the verb showing the present condition of the idea followed by its implementation.

E-40 Government can create conducive environment by formulating policy and laws in favor of women, and NGOs can support government in taking initiatives supporting women. (Obligatory/ Explicit/Objective)

E-41 These capital gains can be attributed to signalling effect about future prospects of new firm (information hypothesis) or expected synergy benefits (synergy hypothesis). (Usuality/Explicit/Objective)

E-42 In such a situation mass media e.g., radio and TV could play a vital role in creating awareness about problems affecting daily life, programs related to family planning, poverty reduction programs, gender issues, and human rights etc.(usuality/explicit/inter-subjective)

E-43 Women's empowerment could be ensured by enhancing cognizance of the women concerning their rights. (Obligatory/ Explicit/inter-subjective)

3.3. Methodology Section

Research methodology is the third chapter of a thesis which refers to the process of conducting any research. The chapter usually consists of research design, data under research, data gathering and analysis tools and procedures. It also

provides answers to questions like why the research has been conducted, in which terms the research problem is defined and in what ways it will be sorted out, which data has been selected for analysis and what particular technique has been adopted to analyze it. The chapter also reflects on the prominent domains of qualitative and quantitative techniques (Goundar, 2012). Modal functions are least effective in methodology and lack frequent occurrences as depicted in Table 4.

A) *May/Might*

In comparison to the previous two chapters of the economics theses, the methodology chapter showed the least number of values with modal verb *may*. Only two hits have been reported in methodology chapters, out of which one is the naming category and the other existed as the semantic category of probability. None of the pronoun usages has been observed like in the other two chapters of the theses.

E-44 In addition, the result for predicted probability sometimes may not be within the range of 0 and 1. (probability/ inter-subjective/ explicit) Modal verb *might* is having no occurrences in methodology chapters.

Table 4 Modal Categories in Methodology Chapter of Economics

S. No.	Model markers	Hits	Modalization		Modulation		Subjectivity-inter-subjectivity/ Objectivity
			Probability	Usuality	Obligation	Inclination	
1	May	2-1	1	-	-	-	0-Sub, 0-Obj, 1-intersub
2	Might	0	-	-	-	-	-
3	Should	0	-	-	-	-	-
4	Shall	0	-	-	-	-	-
5	Must	0	-	-	-	-	-
6	Can	5	3	2	-	-	Sub-0, Obj-0, inter-sub-5
7	Could	0	-	-	-	-	-
8	Would	1	-	-	-	1	Inter-sub
9	Will	1	1	-	-	-	Inter-sub

B) *Should/ Shall/Must*

All of these three modal verbs are having no occurrences in the methodology chapter of the economics thesis.

C) *Can/Could*

Unlike the introduction and literature review chapter, *can* is the only most frequently occurring modal verb in the methodology chapters of economics. It

is the modal verb with the highest number of occurrences. The essence of this modal verb is close to the epistemic possibility or probability; here the writer reports the state of facts and draws conclusions on the basis of experiments or observations. No subjective or objective occurrences are evident in five hits of the modal verb *can*.

E-45 There are some important characteristics that can affect and determine household education status, wealth status and food consumption (inter-subjective/probability)

E-46 Theoretical framework develops a structure that can hold and support a theory regarding research study. (usuality/ inter-subjectivity/explicit)

D) *Would/Will*

Will and *would* both share an equal frequency of occurrences in methodology chapters of the economics theses. The modal verb *will* refer to predictability conveying the speaker's confidence in the truth of the proposition based on evidence of the previously mentioned situation. *Will* usually reflect subjective modality as depicted in the given example.

E-47 If a person is more educated then he will get a respectable status in society. (Probability/Explicit/Objective)

The modal verb *would* has also one occurrence that reflects inter-subjective reality mentioning chosen choices by the speaker.

E-48 When household consumes a reasonable amount on food and has a balanced diet, then that household would be considered as a food secured household (Inclination/inter-subjective/explicit)

3.4. Discussion Section

This is usually the final chapter in many theses signifying the study, and its results and directing results back to the initial hypothesis and research questions. The chapter illustrates the findings and fits them into the context of overall research. In this chapter, the writer is dealing with three levels of study: interpretation, analysis and explanation. Here the writers try to develop a link of study with current literature in the field and also are self-critical by referring to the limitations of the study with its broader application (Dunton, 2021). Modal verbs perform similar function and its occurrences in Discussion chapter are shown in Table 5.

A) *May/Might*

May has comparatively fewer occurrences than in introduction and literature reviews. Out of 7 hits, one is a naming category which refers to the name of the month of May. The modal verb *may* refer to epistemic possibilities with no subjective orientation at all. Most of the occurrences are inter-subjective in nature and have one objective notion.

E-49 It may be resulted by the fact that there is a wide range of planting times for sugarcane in practice in Pakistan—i.e. September to November and February to March. (Objective/probability/Explicit)

Table 5 Modal Categories in Discussion Chapter of Economics

S.No	Model markers	Hits	Modalization		Modulation		Subjectivity-inter-subjectivity/ Objectivity
			Probability	Usuality	Obligation	Inclination	
1	May	7-1	4	2	-	-	0-Sub, 1-Obj, 5-inter-sub
2	Might	1	1	-	-	-	-1-Inter-subjective
3	Should	14	-	-	7	7	0-Sub, 1-obj, 13-inter-sub
4	Shall	0	-	-	-	-	-
5	Must	0	-	-	-	-	-
6	Can	27	11	9	-	7	5-Sub, Obj-4, 18 inter-sub
7	Could	16	-	1	5	10	2- Obj, 0-Sub, 14-inter-sub
8	would	9	1	-	5	3	9-Intersub
9	Will	27	-	-	12	15	0-Sub,4-Objective,23 Inter-Sub

Contrastively, *might* has a single occurrence referring to probability meaning of modality

E-50 Having such insignificant variables, it is possible that the other variables might be affected adversely (probability/explicit/inter-subjective).

B) Shall/ Should/Must

The modal verb *shall* has no occurrences in the discussion chapter of economics thesis while *should* showed up with a comparatively major number of hits in comparison to other previously occurring modal verbs. *Should* primarily exist in the form of deontic meaning reflecting either obligation or inclination in terms of the desirability of action driven by the speaker or the action needed to be performed as a result of moral or legal obligation. In the given text, *should* exists with common nouns reflecting inter-subjectivity of the author.

E-51 Women in Sindh should particularly be facilitated to have in-house provision of water wherever and whatever is possible (Obligatory/Explicit/Inter-subjective).

E-52 Policies should be designed to enhance capacity building of community organizations and social groups in rural areas of Pakistan (Obligatory/inter-subjective/explicit).

E-53 An increased emphasis should be placed on the secondary and higher education of primary school leavers so that young people could be equipped with the skills needed to cope with the fast changing globalized economy (Inclination/inter-subjective/implicit).

Unlike the literature review and introduction chapter of the economics thesis and like the methodology chapter of the theses, *might* has zero existence in the discussion chapter of economics reflecting the nature of the chapter that does not refer to any impositions or complementary ideas but the discussion chapter involves mere discussion of the ideas.

C) *Can/Could*

Can has the highest number of frequencies in the discussion chapter of the economics thesis that refers to possibilities of events and situations. It also forecasts the future implications and suggestive ideas for future possible research. In addition to epistemic frequencies in the text, the chapters have some deontic mentions too reflecting inclination towards some ideas and research trends, as shown in the example below.

E-54 Farmers can use their assets as a source of financing for the adaptation of new crop varieties or to purchase inputs of production (Inclination/inter-subjective/explicit)

E-55 Policies designed to educate farmers can also reduce these numbers as education realize them of the importance of social contacts in providing finances required in the times of shocks (Probability/Inter-subjective/implicit).

The first person and second person pronouns are frequently used as compared to the previous chapter of methodology in order to reflect the subjective and objective opinions respectively while explaining research results.

E-56 On the bases of this, we can conclude that remittances receiving household are more food secure than non-receiving households due to the lesser presence in the poor group and a greater presence in the secure group (Usuality/Subjective/Implicit).

E-57 Agriculture land is used as an input for livestock, it can reduce the cost of livestock (probability/Objective/Explicit)

Could has the second highest frequency in the discussion chapters of economics thesis and is used to reflect allowance of action and validating an idea already proven through research methodologies. *Could* usually occur in a deontic sense, referring to either obligation or inclination towards an idea or activity. Subjective opinion has also been depicted by using the first person pronoun *We*.

E-58 From this analysis we could safely say that farmers in Pakistan perceive a change in climate (Subjective/explicit/Inclination).

E-59 Excessive irrigation could damage crops and have negative impacts on yield, soil oxygen and carbon dioxide concentration balance due to nitrogen leaching and runoff (Inter-subjective/Explicit/Obligation).

E-60 We were not able to find a reasonable number of farm households who adapt only ‘change in time of sowing’, or only ‘change in irrigation’ as a strategy to deal with the impacts of climate change; hence, separate impact analyses could not be performed (Inter-subjective/Explicit/Obligation)

D) *Would/Will*

The modal verb *will* is equally the most frequently occurring modal verb like *can* and is mostly regarded as epistemic referring to the probability or usuality of ideas in the present and past situations. It discusses predictability carrying the speaker’s confidence in the truth of the proposition based on evidence of already completed research. It mostly refers to subjective modality occasionally taking modality as objective reality. The third person pronouns frequently occur in the text referring to objective realities.

E-61 Excessively high application of fertilizer will lead to soluble salt injury and will burn roots of the plants, that will result into a poor functioning of the plant by disturbing the absorption of water and nutrients (inter-subjective/usuality/explicit).

E-62 However if a mother is not educated then it will not be easy for her to provide balance food to the family (Objective/Explicit/Usuality).

E-63 Reduction in fertilizer use will reduce yield of crops differently depending on the crop, soil fertility level, climate conditions and production practices (Probability/Explicit/inter-subjective)

In contrast to the modal verb *will*, *would* have a comparatively low number of occurrences in the discussion chapter. *Would* refer to the deontic meaning of modality showing the number of best possible selections available as a result of proven studies and research.

E-64 Research of different economist shows that if parents are educated then there would be a positive impact on the family member’s educational level (Tariq, 2010) (Inter-subjective/Explicit/Inclination)

E-65 In the same way, if the number of income earners in a family is low there would be a negative impact on education, poverty reduction and food consumption. (Obligation/explicit/inter-subjective)

E-66 The most suitable temperature range for its growth is 22°C to 31°C and beyond this range the temperature would adversely impact yield (Wassmann et al., 2009). (Obligation/Explicit/Objective)

These examples reflect an inclination towards an idea of getting education and obligation modal verbs to refer to scientific facts and figures.

4. FINDINGS AND DISCUSSION

Economics and linguistics are closely linked together as two spheres of science that reflect people's performance and thinking. That is why a country's economic achievements are related to culture and language. This leads to the discussion of a new field of linguistics referring to development that takes place in two directions from language to reality and from reality to language (Zaykova, 2018). Modality as a grammatical tool is also regarded to be polysemic in nature (Sweetser, 1990), that is motivated by metaphorical mapping from the external world of socio-physical existence to the abstract world of reasoning and mental processes which portrays lexical polysemy relating distinctive senses of the word. That is why non-native writers face a lot of problems assigning meaning to modal verbs and limiting it to a single sense. Therefore, like any discourse, economics academic discourse caters to multifaceted meaning of modal verbs where different meanings could be ascribed to one modal verb.

In academic registers, modal verbs perform some distinctive functions other than epistemic and deontic as suggested by Thompson (2001). While examining two sets of PhD thesis, he proposed eleven functional features of modal verbs developed after qualitative analysis of different sections of the thesis. These features include 1) Describing properties of the subject of enquiry 2) Considering alternatives 3) Hedging 4) Metadiscourse 5) What is possible or necessary, given the circumstances 6) Indicating legitimacy 7) Expressing enabling functions 8) Referring to required actions or conditions 9) Stating expectations and making predictions 10) Suggesting the potential 11) Stating the principles. Since these functions are specific to academic discourse so they seem to be relevant to the study. However, the metadiscoursal function is excluded from the analysis because a lot of research has already been done on these domains pertaining to academic and non-academic discourse in the Pakistani context.

Economics academic discourse is enriched with different types of modal verbs and entails a variation in form and function among different chapters of PhD thesis writing. *Can* and *may* are considered to be the most consistent and frequently occurring modal verbs in this discourse. The second chapter of the Literature Review is taken as the lengthiest and densest section of a thesis in terms of occurrences of modal verbs pertaining to the bigger size of the corpus in this section. Other modal verbs vary in number and function per chapter depending upon the size of the corpus and the context in which that function is performed. Like the functions highlighted by Thompson (2001), this study has adopted eight functions pertaining to these modal verbs performed in academic discourse.

4.1. Describing Properties of the Subject of Enquiry

It involves describing what is typical of a phenomenon or subject. *May* and *will* are usually used to perform the function. Like in the literature review of a thesis

related to the social reference of women's participation has an example, 'cultural factors may hide the potential of women'; here the modal verb *may* explain the subject in question. Another example from the literature review refers to determinants of firms in Pakistan and operational hedging like 'firm size may act as a double-edge sword in acquisition market'.

4.2. *Considering Alternatives*

It involves a writer considering various other strategies and concepts through the use of modality. Modal verbs *can*, *would* and *may* are used to reflect such alternatives. The introduction of one of these related to 'Impact of remittances on household welfare' entails an example like 'The phenomenon of gender violence can also be observed in the form of forced marriage'. Here gender violence is linked with the marriage that is forced by family or society and it poses marriage as an alternative to violence. Modal verbs in Pakistani Economics research writing can also show the cause and effect process in writing e.g. modal verb *would* is used to reflect the cause and effect relationship like in 'if parents are educated then there would be a positive impact on the family member's educational level' (Tariq, 2010). Here the chance of a family being literate is shown as an effect of parents being educated.

4.3. *Hedging*

In academic discourse hedging, is defined as a linguistic strategy that allows the author to avoid absolutely making a commitment to a certain claim or making it an absolute truth (Crompton, 1997). It presumes that by using hedging tools in academic discourse, a writer basically keeps himself distant from the actual truth and creates a space for the reader to participate in academic dialogue and play his role in the interpretation of the text. For example, in the discussion section of the economics PhD thesis, a claim for a gender-biased approach has been made using modal verb *can* is referring to the possibility but not directly owned by the writer himself like 'Awareness campaign on female participation in decision making of important farm and non-farm activities can reduce gender bias in the farming communities of Pakistan in general and Sindh in particular'. Similarly, in another example modal verb *may* is used to proclaim and propose an idea indirectly like 'Farmers may perceive climate change by observing the change in temperature, precipitation and/or in intensity and frequency of weather events'.

4.4. *Possibility or Necessity*

It discloses the results and inferences that are likely to happen. Modal verbs *can* and *would* are used to convey either of the two meanings. For example, 'create such a favorable environment for women that can assist them to attain empowerment in a true sense'. Here modal verb *can* is referring to the necessitation of an idea with its powerful future implementation. Another example with the modal verb *can* refer to the possibility of a situation, e.g. 'Another firm may seek the opportunity and can acquire such firm and remove the old management'. Here the writer is declaring a strong possibility of an event with an added future incentive as mentioned in the given example.

4.5. *Legitimacy*

It refers to state claims based on reasoned arguments. *May*, *might*, *can* and *could* are used to indicate legitimacy in academic discourse. Like in the economics thesis entitled ‘Adaptive Capacity, Adaptation to Climate Change and Farm Productivity: Evidence from Pakistan’ *could* is used to make genuine claims as in ‘Vulnerability could be influenced by both monetary and non-monetary socio-economic, institutional and political factors’; similarly *can* is used to make a stance as in example ‘Adaptation can both reduce the yield losses resulting from climate change and improves yield when a change in climate is beneficial’ (Adams et al., 1999). Likewise, *may* is used to build a valid argument like example ‘Climate changes not only likely to result in significant yield variability in many regions of the world, it may also lead to the escalation of prices and hunger among poorest nations’.

4.6. *Expressing Enabling Functions*

Modal verbs in addition to the possibility function refer to their counter function also of non-possibility, to state if anything is possible or not possible. Modal verbs *can* and *could* are used to perform such functions. In economics academic discourse, a thesis entitled ‘Impact of remittances on household welfare: a case study of district lower Dir in Pakistan’ *can* is used to refer to possibilities after the perceived results in the example: ‘Results also concluded that 83% of remittances receiving households can fulfill the basic needs of healthcare (i.e., transportation cost on healthcare, hospital and doctor fee, diagnostic tests charges, medicine cost)’. Adding *not* with *can* refers to a situation that is impossible to happen, like in the thesis entitled ‘Determinants of women’s empowerment in Punjab, Pakistan’, *can* is used to refer to the non-possibility of action as in ‘Without fully realizing the potential of all human beings, the notion of people’s development cannot be materialized in the true sense, and if development is not engendered, it is endangered (Human Development Report, 1995)’. Even *can* without *not* is referring to least possible or nearly impossible situations like ‘Liberal feminists are certain that such objectives can be attained by adopting reasonable feminists’ strategies which may be executed inside the prevailing representative political set up in the absence of the inevitability of drastic modifications in the society’ (Beasley, 1999). Similarly, *could* is also used to refer to the least likelihood of an incident for example ‘Women’s empowerment could be ensured by enhancing cognizance of the women concerning their rights’.

4.7. *Referring to Required Actions and Conditions*

In line with the previous function, modal verbs perform an added function of indicating required actions and highlighting necessary conditions to carry out a task. It is carried out through modal verbs *should* and *must*. Like *must* is used to refer to a required action in policy-making as in example ‘The people must be taken into consideration, while constructing the policies’. In another example *must* and *should* refer to a necessary condition for an action to take place like ‘in any strategy focused on empowerment must support that women should themselves analyze their own conditions and outline an alteration in the

society'. *Should* is also used to refer to the required actions for example 'Similarly, opportunities for higher education and paid jobs should be provided to women to make them empowered'.

4.8. *Expectations and Predictions*

Modal verbs *will*, *would*, *should* and *may* are used to state expected outcomes and make future predictions of the study. The modal verb *should* in one of the economics thesis makes future predictions, as in example 'It is the need of the hour to empower women, especially, the women in the developing world, should be active agents of economic development'. *Should* is also used to reflect future outcomes of the study, like in example 'Their worth can be recognized at home by their hard work there hence, they should participate so much so at home that their male counterparts are compelled to say "our house is worthless without women'. Likewise, the modal verb *would* is used to refer to future expectations as for example 'This would augment women's earning capacity, power of bargaining, control over resources, share in economic decision making at the household level, fulfilling the fundamental needs, and collectively, all in combinations could help improve their self-sufficiency thereby, minimizing their economic dependence' (Parveen & Leonhauser, 2005).

4.9. *Stating the Potential and Principles*

Modal verbs *can* and *could* are used to reflect potential benefits and limitations of a study while modal verbs *will* and *would* are used to show another function of stating principles. Modal verb *will* is used to state principles of psychological empowerment in terms of 'It will enhance self-assurance, bargaining strength, and independence of choices within the families' (Parveen & Leonhauser, 2005) and in another example stated as 'This situation of resource deficit would contribute negatively to an individual's self-esteem'. In a thesis entitled 'Determinants of firms' acquisition ability and its impact on cost efficiency, operational hedging and returns of acquirer firms in Pakistan' *could* with *not* is used to reflect the limitation of a study as in example 'Another study concludes that Sarbanes-Oxley Act could not bring changes in quality of earnings before mergers and acquisition transactions'. The modal verb *could* individually also highlight limitations of the study as in the example, 'So researchers could only compare operational hedging of the acquiring firms before and after the acquisition of the target firm'. In contrast, the modal verb *can* is used to refer to potential benefits of the acquisition of a firm for example 'Another benefit of the acquisition of another firm can be diversification of the operational activities of the firm', and in another example 'Another long term impact of the acquisition on bidding firm can be the change in the operational hedging of the firm after the acquisition'.

5. CONCLUSION

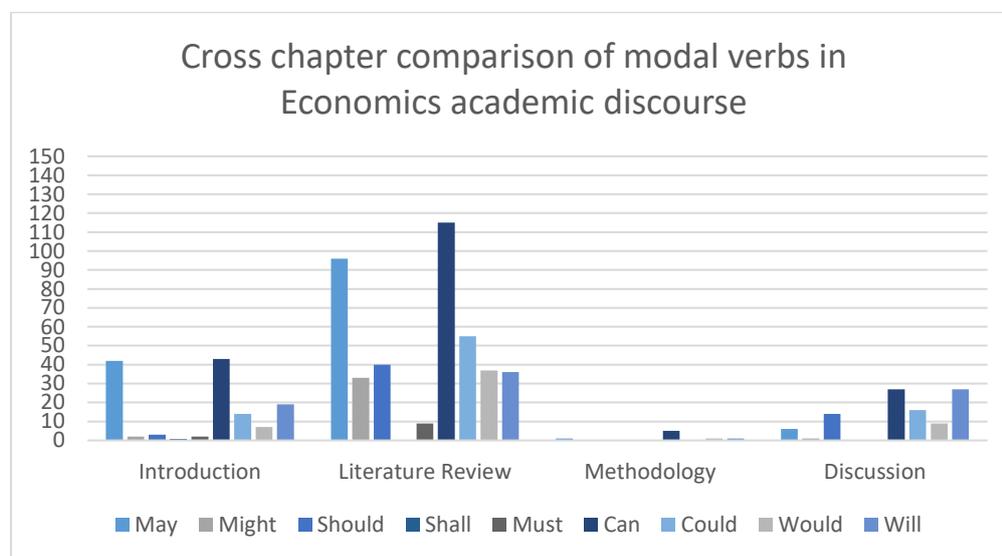
The study has effectively explored modal tendencies and their function in economic academic written research discourse through an extensive version of academic genre i.e. PhD thesis writing. Among a list of modal verbs adapted for the study, *can* is the most consistent modal verb in all selected four chapters of economics PhD thesis writing. Among four selected chapters of PhD theses,

Literature Review is considered the dense chapter in terms of modal verbs as shown in Figure 2 reflecting different meanings of modal domain like probability, usuality, obligation and inclination catering basic metaphorical nature of economic discourse. However, the Methodology chapter of the Economics PhD theses is having the least occurrences of modal verbs where only *can* is the only frequently occurring modal verb used as a hedging tool to address possible outcomes and research claims avoiding absolute stance at this initial stage of constructing methods and tools of the research. *May* is the second most frequently occurring modal verb in Pakistani Economics research discourse with excessive existence in the second chapter of the Literature Review in order to forecast any expectations or make predictions. The modal verb *shall* is the least existing modal verb in the whole economics research corpus with only one occurrence in all four chapters of PhD thesis certainly due to the reason it reflects imposition and compulsion of an action which is not the core nature of academic discourse. The research also validates the claim of academic discourse being epistemic in nature (Rizomilioti, 2006) by depicting more modalization (epistemic) features in Pakistani research discourse of Economics PhD thesis among all four chapters of PhD thesis of economics discourse. These epistemic meanings keenly tailor the need for academic discourse and the nature of economics as an academic discourse where the writer is referring to possibilities of events aligned with actual facts and the usuality of action and ideas that are stereotypically occurring and followed in our Pakistani culture and society. This research on Pakistani research discourse depicts that the writer is not only supposed to reflect his thought but to convince and sometimes manipulate the thought with contextual alternatives and justifications for the stated ideas by using the modulation (Deontic) system of modality. Modulation is anyway regarded to be the feature of legal language more than any other discourse as it entails obligation and inclination of thoughts towards an idea. But Pakistani Economic research discourse openly owns this modulation feature as a part of inviting the reader towards an idea in terms of the writer's inclination and sometimes taking an obligatory stance for implementation in all four chapters of PhD thesis. For such an in-depth meaning trickling down each modal verb, the study also extended its analysis in terms of modal functions reflected in different contexts performed by these modal verbs in Pakistani academic research discourse of economics including referring to alternatives, legitimizing ideas, making predictions, showing expectations and stating principles and ideas.

The study has also practical and pedagogical implications for advanced learners of the English language. It should be the concern of EAP learners specifically in Pakistani research discourse, where they should be knowing the very truth that modal verbs are polysemous in nature. It means one modal verb can perform many functions and one function could be performed by different modal verbs. Pakistani research writers being non-native learners should be conscious enough of the strong impact of modal verbs in academic writings specifically making recommendations for future research which may be kept in a suggestive way by using modality as a hedging tool and not making direct impositions. The study also enlightened the Pakistani economics discourse community about their own means of communication besides the targeted scientific nature of the discourse. It also sheds light on the structure of non-

native academic written discourse as a whole in one of the scientifically driven disciplines of social sciences, i.e. economics and sought out the traditional writing patterns in one of the densely created genres of thesis writing. Above study also caters SDG 4 of Quality education in UN's Sustainable Development Goals announced in 2015.

Figure 2 Cross-Chapter Comparison of Modal Verbs in PhD Thesis of Economics Research Discourse



Conflict of interests

We as authors declare that we have no conflict of interest.

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