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Gendered use of hedges in the discussion and conclusion sections of research articles

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Abstract
Following Lakoff's (1975) claim that women hedge in speech more often than men, a large number of studies have investigated the role of gender in academic discourse and produced limited evidence, indicating the need for more research to highlight the role of gender in academic writing. The aim of this study was to cross-culturally examine how gender may affect the use of hedges in the *discussion* and *conclusion* sections of research articles. For this purpose, the study adopted Salager-Meyer's (1997) taxonomy of hedges to qualitatively and quantitatively examine the types, frequency and gendered use of hedges in a small-scale corpus of research articles produced by 20 Saudi male and female researchers. The overall results showed that both genders employed Salager-Meyer's taxonomy of hedges and used more hedges in the *discussion* than in the *conclusion*. Males hedged more than females, but the difference was not statistically significant except in certain cases, such as the use of two modal lexical verbs (*indicate* and *seem*) and the modal auxiliary verb (*must*). Moreover, the results revealed a marginal significant difference in the use of *adjectival*, *adverbial* and *nominal* phrases. Females tended to employ more of these hedges than their male counterparts. The findings contribute to a better understanding of the relationship between gender and hedging in academic discourse, and may guide postgraduate students towards the appropriate use of hedging devices in their research development. They also emphasize the need for further research on the role of gender across disciplines, languages and cultures.
Keywords: *discourse analysis, academic discourse, hedges, gender, research articles*

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Влияние гендера на хеджирование в разделах «обсуждение» и «заключение» научных статей

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Аннотация
Утверждение Робин Лакофф (1975) о том, что женщины прибегают к хеджированию в речи чаще, чем мужчины, способствовало появлению большого количества исследований, посвященных изучению роли гендера в академическом дискурсе. Однако было приведено ограниченное количество доказательств, что указывает на необходимость проведения дальнейших исследований для выявления роли гендера в академическом письме. Данное кросс-культурное исследование нацелено на выявление того, как гендер может влиять на использование хеджирования в разделах «обсуждение» и «заключение» научных статей. Материалом послужил корпус научных статей, написанных 20 саудовскими исследователями – мужчинами и женщинами. Качественное и количественное изучение типов, частоты и гендерного использования хеджей проводилось на основе таксономии хеджей Салагера-Мейера (1997). Общие результаты показали, что представители обоих полов употребляют различные типы хеджей и в большей степени они встречаются в «обсуждении», чем в «заключении». При этом мужчины прибегали к хеджированию чаще, чем женщины, хотя разница статистически несущественная, за исключением использования глаголов *indicate* и *seem*, а также модального глагола *must*. Кроме того, результаты выявили незначительную разницу в использовании прилагательных, наречий и именных словосочетаний, которые использовались женщинами чаще, чем мужчинами. Полученные результаты способствуют лучшему пониманию взаимосвязи между гендером и хеджированием в академическом дискурсе и могут быть полезны при написании научных работ. Они также свидетельствуют о необходимости дальнейших исследований в области гендера в разных дисциплинах, языках и культурах.
Ключевые слова: *дискурс-анализ, академический дискурс, хеджирование, гендер, научные статьи*

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1. Introduction

The use of hedges in research articles (henceforth *RAs*) has received a great deal of attention in the past three decades (e.g., Hyland & Tse 2004, Navrátilová 2013). There is no single agreed-upon definition of hedging because it has been approached from different perspectives by different researchers over the last three decades (Bonyadi et al. 2012). For example, Varttala (2001) defined hedging as a strategy by which researchers employ expressions relating to vagueness,

uncertainty, or tentativeness. Hyland (2005) described hedges as expressions used to avoid responsibility for the certainty of a proposition inferred from the findings.

There seems to be no one exact definition of hedging in the literature, however, Fraser (2010: 22) concluded that despite variation in terminological issues between various studies, there is a general agreement that hedging is "a rhetorical strategy, by which the speaker, using a linguistic device, can signal a lack of commitment to either the full semantic membership of an expression or the full commitment to the force of the speech act being conveyed." Fraser's definition summarizes the main function of hedging, as almost agreed upon by all researchers, that is; hedges are used to "mitigate or reduce the strength of the assertions that speakers or writers make" (Martín-Martín 2005: 96).

Lakoff (1975) brought women's language vs. men's language to the forefront. Since her publication of *Language and Woman's Place* (1975), a plethora of research has been carried out in the field of linguistics and gender. According to her, certain linguistic features such as indirect request and hedges are used less frequently by men because these features signal uncertainty. This contradicts the expectation that men's speech is powerful, while women's speech is tentative and uncertain (Coates 2004). One of the features that Lakoff (1975) saw as prominent in women's language is the utilization of lexical hedges as a class of devices employed to soften and add uncertainty to their utterances. Women were found to use hedges more than men in conversations. However, Lakoff's claim was based on her self-analysis and, therefore, represents a methodological weakness (Dousti & Rasekh 2016). More specifically, she collected her data by means of informal conversations within her private social network, without taking into account social factors or controlling for equal distribution of men and women (Pellby 2013).

Following Lakoff's (1975) seminal research on gender differences in language use, several studies have shown different results regarding the gendered use of hedges in discourse. For example, Holmes (1995) found that men used hedges in their apologies to serve epistemic goals as tentativeness and imprecision, which contradicted Lakoff's (1975) conclusion that women use hedges more than men to express uncertainty. Similarly, Pellby (2013) addressed Lakoff's (1975) claim that women hedge to signal uncertainty. She found that women hedged more than men for different reasons. According to her, the occurrences of these hedges in women's speech mostly included the epistemic modal function and shields suggesting uncertainty about the utterance and certainty about the utterance respectively. As a result, Pellby refuted Lakoff's conclusion that women use hedges simply to express uncertainty and tentativeness.

Several studies (e.g., Basturkmen 2012, Tran & Duong 2013) have shown that hedges are frequently used in academic writing across languages and disciplines. According to Swales (1990), *RAs* are generally subdivided into four main sections (*introduction*, *methods*, *results*, and *discussion*), with each one serving distinct rhetorical purposes. Hedges were found to appear more in the *discussion* section (Behnam et al. 2012, Navratilova 2013) because it is the place in the *RAs* where

researchers critically discuss their findings and attempt to situate their arguments within their discourse community. They employ hedges in their *RAs* as metadiscourse markers to cautiously present their findings, and leave more space for negotiation (Tran & Duong 2013). According to Hyland (1998), hedges present new claims for endorsement and shape the *RA* as the principal vehicle for new knowledge. Salager-Meyer (1997) argued that hedges serve three main strategies; minimizing threat and avoiding absolute claims; reflecting the certainty of knowledge; and creating respect between authors and editors. Myers (1989) pointed out that any statement that carries a claim but is not hedged is most likely not a statement of new knowledge. He argued that hedging in scientific discourse is the reaction to the actual or assumed interaction between the author and audience.

A number of researchers suggested various taxonomies of hedges in *RAs*. These hedging taxonomies are neither totally comprehensive nor categorically watertight, and different conceptualizations of hedging classifications among researchers provide clear evidence that interpreting results should be approached with caution. For instance, Hyland (1998) proposed two alternative categories as main realizations of hedges in *RAs*: lexical and strategic hedges. Another well-known taxonomy in the literature was the one advanced by Salager-Meyer's (1997) who suggested seven-taxonomy types: *modal auxiliary verbs* (e.g., can) *modal lexical verbs* (e.g., to indicate), *adjectival*, *adverbial*, and *nominal modal phrases* (probability adjectives: e.g., possible; nouns: e.g., claim; adverbs: e.g., presumably), *approximators of degree*, *quantity*, *frequency* and *time* (e.g., about, often), *introductory phrases* (e.g., it is our view that), *if clauses* (e.g., if true) and finally *compound hedges* (e.g. could be suggested). Salager-Meyer's taxonomy of hedges was adopted in this study due to its adequacy, popularity and tested validity in several previous studies.

To conclude, hedging has been claimed to be a strategy used to express certainty or uncertainty and has been shown more often by female writers than by male writers (Ansarin & Bathaie 2011, Lakoff 1975). To our best knowledge, there has been no study that investigated the gendered use of hedges in the *discussion* and *conclusion* of *RAs* produced by Saudi scholars in the field of applied linguistics, making the conduct of this study a necessary and important contribution to the literature on women's language. Therefore, the rationale of this study is to bridge this gap in the literature by investigating the types, frequency and gendered use of hedges in the academic writing of Saudi scholars within Salager-Meyer's (1997) seven-taxonomy types of hedges. Accordingly, the current study addressed the following three research questions:

1. How frequently do Saudi males and females employ hedges in *the discussion and conclusion* sections of their *RAs*?
2. What are the types and frequencies of hedges used by Saudi males and females in the *discussion and conclusion* sections *of* their *RAs*?
3. How significantly does gender affect the use of hedges in the *discussion* and *conclusion* sections of Saudi researchers' *RAs*?

2. Previous research on gendered use of hedges

The question of whether women and men differ in their academic use of language has received considerable attention over the last three decades in various disciplines, including language studies. However, there is still a striking shortage in the number of studies that investigated the gendered use of hedges in academic discourse.

Ansarin and Bathaie (2011) examined the linguistic realizations of the identifications mirrored in male and female scholars' choices for hedges in 130 one-authored *RAs* in applied linguistics. They found that women hedged in *RAs* more than men because female authors detached themselves from the commitments to the truth value of their findings, showing hedging as an indicator of the scholars' gender.

Serholt (2012) investigated whether there were gender related differences in the overall frequency of hedges in the academic writing of Swedish advanced learners of English. She found that male students used hedges more frequently than female students. However, both groups showed a substantially higher use of hedges and frequently employed the modal verbs *might, could*, and *may,* and the lexical verbs *seem* and *suggest* regardless of gender. Serholt concluded that gender didn't seem to be a determining factor for Swedish advanced learners' academic writing.

Farahani and Hassani (2014) investigated the differences between Iranian males and females in the use of hedges in 60 applied linguistics *RAs*. They found that males employed more hedges than their female counterparts, hence refuting Lakoff's (1975) claim that women use more hedges than men. Furthermore, the study identified that the discussion section of the *RAs* contained more hedges than the introduction section, thus supporting previous studies (e.g., Hyland 1996, Varttala 2001).

Yeganeh and Ghoreyshi (2015) examined gender differences in the abstract and discussion sections of forty English *RAs* written by native speakers of Persian. They concluded that females preferred to use more hedges than males to express the data they provided. This conclusion was not supported by Hidayat et al. (2017) who found that male writers hedged as much as females, and attributed this to the similarity of the genre of the academic texts because they have the same convention that should be adhered to by both male and female authors.

More recently, Gul et al. (2020) investigated the gendered use of hedges in 100 Pakistani engineering *RAs*. The findings showed that male writers used more hedges than female writers in expressing their statements, whereas female writers used a smaller number of hedges in stating their findings.

Argina and Ijabah (2022) examined 40 *RAs* written in English by Indonesian male and female postgraduate students majoring in English Education to identify if there were any differences between them in using hedges in *RAs*. The results demonstrated that although Indonesian male English students employed hedges in their *RAs* more frequently than Indonesian female English students did, there was no significant effect of gender on the use of hedges in *RAs.* However, the result

showed a significant effect of gender on the use of some types of hedges such as adverb of frequency and quantifiers, with male students using these types of hedges more than female students.

In another study, Motlagh (2021) analyzed the introduction and discussion sections in 66 academic papers by male and female writers in applied linguistics. Contrary to Lakoff's claim, male writers employed hedges more than female writers. The discussion section was hedged more than the introduction section. Male writers used *modal verbs* and *adjectives* more often, while female writers used *lexical verbs*, *adjectives* and *modal verbs* more frequently in their *RAs*.

In a more recent study, Ajmal et al. (2023) compared the use of hedges by male and female native English writers in several genres, such as academic papers, newspaper articles, and fictional works. The findings indicated that female writers used hedges more than male writers, and that such use varied across different genres of writing.

To summarize, the existing research findings suggest a limited connection between the use of hedges and gender in academic discourse. Hence, there is insufficient evidence supporting Lakoff's (1975) claim that women hedge more than men, making the conduct of this study a significant contribution to the literature on gender and academic discourse.

3. Materials and methods

3.1. Research design

Our study employed a mixed research design. It analyzed the data both qualitatively and quantitatively. To achieve this, the types and frequencies of hedges were analyzed qualitatively and quantitatively on the basis of Salager-Meyer's (1997) taxonomy of hedges, as shown in Table 1 below.

Table 1. **Salager-Meyer's (1997) taxonomy of hedges**

Hedges	Examples
1. Modal auxiliary verbs	may, can, would, should
2. Modal lexical verbs	to indicate, to believe, to appear.
3. Adjectival, adverbial, and nominal modal phrases	a) probability adjectives: e.g., probable, possible, b) nouns: e.g., assumption, claim, c) adverbs: e.g., presumably, perhaps, likely.
4. Approximators of degree, quantity, frequency, and time	approximately, usually, roughly, generally, often
5. Introductory phrases	it is our view that, to our knowledge, I believe
6. If clauses	If true, if anything
7. Compound hedges:	double hedges (it may suggest), triple hedges (it seems reasonable to assume that) and quadruple hedges (it would seem somewhat unlikely that)

3.2. Corpus

A corpus of 20 *RAs,* produced by ten Saudi male and ten female authors from the field of applied linguistics, were collected and analyzed. These *RAs* were selected from peer-reviewed journals to ensure their quality and originality. Only the *discussion* and *conclusion* sections of these *RAs* were analyzed for the use of hedges because researchers usually employ them more frequently in these two sections to contribute to their discourse community and gain approval. The *RAs* were drawn from the following peered-reviewed journals: *Studies in Literature and Language*, *English Language Teaching*, *International Journal of Linguistics*, *Arab Word English Journal* (AWEJ) and *Journal of King Saudi University Languages and Translation*.

3.3. Data collection procedures and analysis

Only single-authored *RAs* were selected to ensure commitment to the main goal of this study which was to investigate how gender affects the use of hedges in the sections of *discussion* and *conclusion* of *RAs*. Co-authored *RAs* were ruled out if the co-authors were from both sexes because it is impossible to figure out the role of gender in the writing process. The researchers selected and focused on the *discussion* and *conclusion* sections of the *RAs* because researchers usually contribute new knowledge in these two sections, which may make them use more hedges to soften their language and avoid disagreeing with their discourse community. To allow comparison, the *RAs* were selected so that they treated similar subject matters in applied linguistics and were published in journals with similar research interests.

The *discussion* and *conclusion* sections were meticulously read word by word by each author in order to identify and locate the hedges. To ensure code validity and reliability, the two researchers separately underlined and coded the hedges in each *RA* and then decided together on what a hedge was and then listed these hedges according to their types. *RAs* were assigned a number from 1 to 10 for each gender to refer to them every time the hedges were counted and recounted. Afterwards, the hedges which appeared in the *discussion* and *conclusion* sections were carefully and meticulously listed under each category and then analyzed in accordance with Salager-Meyer's (1997) taxonomy of hedges, as demonstrated in Table 1 above. Their frequencies were statistically tabulated to show the total number of hedges by targeted researchers.

The Statistical Package for the Social Sciences (*SPSS*) was employed to statistically analyze and present the data. The collected data were analyzed using descriptive statistics in terms of the frequency and percentages of hedges used in the targeted *RAs* presented in tables and figures. Additionally, to check if the differences between females and males were statistically significant, an independent t-test was employed. Leven's test for Equality of variance was employed to indicate variances for gender.

4. Results

4.1. Distribution of hedges

Table 2 below displays the overall distribution of hedges as used by male and female writers in the *discussion* and *conclusion* sections of their *RAs*. The analysis of the results showed that both male and female writers used more hedges in the *discussion* section (73%) than in the *conclusion* section (27%). Male writers used more hedges than female authors in

Table 2. **The distribution of hedges in the discussion and conclusion sections by male and female researches**

Section	Male F %	Female F %	Total N %
Discussion	469 52.3	428 47.7	897 73
Conclusion	177 53.3	155 46.7	332 27
Total	647	583	1230

** F=Frequency, N=Number*

both sections with a total number of 647 hedges compared to 583 hedges by female writers. To examine whether the difference between the two groups is statistically significant, an independent t-test was conducted. The t-test indicated that the ten female writers had a mean of 47.7 and the ten male writers had a mean of 52.3 in the *discussion* section. The mean did not differ significantly at the $p<.05$ level ($p=.611$). Similarly, the two groups did not differ significantly in the *conclusion* section. The female group had a mean of 15.4 and the male group had a mean of 17.6 in the *conclusion* section. The mean did not differ significantly at the $p<.05$ level ($p=.611$). Levene's Test for Equality of Variance indicated that variance for the two groups did not differ significantly from each other in the *discussion* section ($F=1.114, p=.305$) and in the *conclusion* section ($F=.560, p=.464$).

4.2. Types and frequency of hedges

4.2.1. The discussion section

Table 3 below demonstrates the types, frequency and percentages of hedges in the *discussion* section as used by both male and female authors. The analysis of the results indicated that both groups used more *approximators* with a total number of 384 hedges, followed by *modal lexical verbs* with a total number of 218 hedges and *modal auxiliary verbs* with a total number of 148 hedges. The hedges least used by both groups in the *discussion* section were *introductory phrases* with a total number of only four hedges.

Table 3. **Types and frequency of hedges in the discussion section by male and female researchers**

Types	Male F %	Female F %	Total
Modal Auxiliary Verbs	76 51.4	72 48.6	148
Modal Lexical Verbs	117 53.7	101 46.3	218
Adjectival, adverbial, and nominal modal phrases	39 41.9	54 58.1	93
Approximators of degree, quantity, frequency, and time	203 52.9	181 47.1	384
Introductory phrases	3 75	1 25	4
If clauses	7 63.3	4 36.4	11
Compound hedges	26 63.4	15 36.6	41
Total	471	428	899

** F=Frequency*

To find out whether the two groups differ significantly in the use of hedges in the *discussion* section, an independent t-test was carried out. They did not differ significantly from each other in the use of Salager-Meyer's (1997) seven types of hedges. However, there seemed to be marginal significance between the two groups in the use of *adjectival*, *adverbial*, and *nominal modal phrases*. Levene's Test for Equality of Variance showed that variance for the two groups differed marginally from each other (*F=4.041*), (*p=.060*). Female writers used more of these hedges than male writers in the *discussion* section. Moreover, the results identified a marginal significance between the two groups in the use of both *introductory phrases* and *if clauses*. Levene's Test for Equality of Variance indicated that variance for the two groups differed marginally from each other in the *introductory phrases* (*F=3.415*), (*p=.081*), and in *if clauses* (*F=3.413*), (*p=.081*). Male writers used more of these hedges than their female counterparts.

4.2.2. The conclusion section

With regard to the *conclusion* section, Table 4 below displays the types, frequency and percentages of hedges as used by male and female authors. As in the *discussion* section above, both male and female writers used more *approximators* with a total number of 117 hedges in the *conclusion* section, followed by *modal auxiliary verbs* with a total number of 114 hedges. Similar to the *discussion* section, the least hedges employed by the two groups in the *conclusion* section were the *introductory phrases* (only one hedge) and *if clauses* (only five hedges).

A t-test was conducted to find out whether the two groups (males v. females) differed significantly in their use of hedges in the *conclusion* section. Overall, there was no significant difference between the two groups in terms of the types and frequency of hedges in the *conclusion* section.

Table 4. **Types and frequency of hedges in the conclusion section by male and female researchers**

Types	Male F %	Female F %	Total
Modal Auxiliary Verbs	61 53.5	53 46.5	114
Modal Lexical Verbs	30 55.6	24 44.4	54
Adjectival, adverbial, and nominal modal phrases	10 34.5	19 65.5	29
Approximators of degree, quantity, frequency, and time	66 56.4	51 43.6	117
Introductory phrases	1 100	00	1
If clauses	2 40	3 60	5
Compound hedges	6 54.5	5 45.5	11
Total	176	155	331

** F=Frequency*

4.3. Salager-Meyer's (1997) taxonomy of hedges

4.3.1. Modal auxiliary verbs

Table 5 below shows the frequency and percentages of the different *modal auxiliary verbs* used by male and female writers in both the *discussion* and *conclusion* of their *RAs*. The analysis of the data showed that male writers used more *modal auxiliary verbs* in the *discussion* and *conclusion* sections with a total number of 137 hedges than female authors who employed 125 *modal auxiliary verbs* in the two sections. The descriptive analysis of the results revealed that male writers used the auxiliary verb *may* more frequently than any other modal auxiliary verbs with a total frequency of 36 times. In contrast, female writers preferred to use the auxiliary verb *can* more than any other modal auxiliary verbs with a frequency of 39 times. However, *can* was the most commonly used auxiliary verb (*F*= 65) in both the *discussion* and *conclusion* sections by male and female writers, followed by the auxiliary verb *may* (*F*= 64). The least used auxiliary verb was *must* with a frequency of eight times. Unlike *may* and *might* which imply that the propositions can also be wrong, *must* leave almost no doubt that the author judges the claim to be true. It reflects a stronger commitment to the proposition than *may* or *might.* With regard to the modal auxiliary verbs *could*, *would* and *should*, the use of *should* was equally distributed among both genders. Nevertheless, *could* and *would* were used slightly more by Saudi males.

To examine whether the two groups differ significantly in the use of modal auxiliary verbs, a t-test was conducted. There was no significant difference between the two groups in the use of modal auxiliary verbs *may, can, might, should, could* and *would*. However, there was a significant difference in the use of the auxiliary verb *must* at the level of .05. Levene's Test for Equality of Variances showed that variance for the two groups differed significantly (*F=10.830), (p=.004*). Male authors used *must* more than female authors.

Table 5. **Frequency and percentages of modal auxiliary verbs**

Modal Verbs	Male F %	Female F %	Total
May	36 56.2	28 43.8	64
Might	12 52.2	11 47.8	23
Can	26 40	39 60	65
Could	22 57.9	16 42.1	38
Would	16 57.1	12 42.9	28
Should	18 50	18 50	36
Must	7 87.5	1 12.5	8
Total	137	125	262

** F=Frequency*

4.3.2. Modal lexical verbs

With respect to *modal lexical verbs*, Table 6 below displays the frequency and percentages of the different *modal lexical verbs* in both the *discussion* and *conclusion* sections of male and female authors' *RAs*.

Table 6. **Frequency and percentages of modal lexical verbs**

Modal Lexical Verbs	Male F %	Female F %	Total
Indicate	32 66.7	16 33.3	48
Show	32 57.1	24 42.9	56
Believe	6 46.2	7 53.8	13
Suggest	8 44.4	10 55.6	18
Seem	22 71	9 29	31
Tend	9 64.3	5 35.7	14
Report	8 44.4	10 55.6	18
Appear	6 50	6 50	12
Reveal	4 36.4	7 63.6	11
Others	20 39.2	31 60.8	51
Total	147	125	272

**F=Frequency*

The results showed that the three lexical verbs *show* (*F=56*), *indicate* (*F=48*) and *seem* (*F=31*) are the most commonly used by male and female authors in the discussion and conclusion sections of their *RAs*. However, male authors used these lexical verbs more frequently than female authors, with a frequency of 147 for males and 124 for females. Other lexical verbs such as *suggest* (*F*=18), *report* (*F*=18), *tend* (*F*=14) were used less by the two groups. An independent t-test showed no significant difference between male and female authors in the use of lexical verbs except two lexical verbs *indicate* and *seem*. Levene's Test for Equality of Variance revealed that male authors differ significantly from female authors in the use of the verb *indicate* at the level of .005. Levene's Test for Equality of

Variance suggests that males used this modal lexical verb more than females (*F=13.434), (p=.002*). There was also a significant difference between the two groups in the use of the lexical verb *seem*. Levene's Test for Equality of Variance indicated that male authors differ significantly from the female authors in the use of the verb *seem* at the level of .005 (*F=4.288), (p=.053*).

4.3.3. Adjectival, adverbial and nominal modal phrases

Table 7 below presents the frequency and percentages of *adjectival*, *adverbial* and *nominal modal phrases* as used by male and female writers in both the *discussion* and *conclusion* sections of male and female writers' *RAs*.

Table 7. **Frequency and percentages of adjectival, adverbial and nominal modal phrases**

Types	Male F %	Female F %	Total
Adjectival Phrases	20 44.4	25 55.6	45
Adverbial Phrases	6 50	6 50	12
Nominal Phrases	23 35.9	41 64.1	64
Total	49	72	121

F=Frequency

The analysis of the data showed that female writers used more *adjectival*, *adverbial*, and *nominal modal phrases* than male writers with a total number of 72 hedges, in comparison to 49 hedges by male writers. However, both groups employed more *nominal phrases* (*F=64*), followed by *adjectival phrases* (*F=45*). *Adverbial phrases* were the least used hedges by the two groups (*F*= 12). An independent t-test analysis of the results demonstrated no significant difference between the two groups in terms of the *adjectival*, *adverbial*, and *nominal modal phrases*.

4.3.4. Approximators of degree, quantity, frequency and time

Table 8 below presents the types, frequency, and percentages of *approximators of degree*, *quantity*, *frequency*, and time in both the *discussion* and *conclusion* sections of male and female writers' *RAs*.

Table 8. **Frequency and percentages of approximators of degree, quantity, frequency and time**

Approximators	Male F %	Female F %	Total
Degree	32 64	18 36	50
Quantity	160 51.1	153 48.9	313
Frequency	67 54.9	55 45.1	122
Time	10 62.5	63 7.5	16
Total	269	232	501

**F=Frequency*

The analysis of the data revealed that both groups employed more *approximators of quantity* (*F*=313), followed by *approximators of frequency* (*F*=122). *Approximators of degree* (*F*=50) and time (*F*=16) were found to be the least used hedges by both male and female writers. Overall, the descriptive analysis of the results showed that male writers used more *approximators* (*F*=269) than female writers (*F*=232). An independent t-test revealed no significant difference between the two groups in the use of *approximators of degree*, *quantity*, *frequency*, and *time*.

4.3.5. Introductory phrases, if clauses, and compound hedges

Finally, Table 9 below demonstrates the other types of hedges suggested by Salager-Meyer (1997): *introductory phrases*, *if clauses*, and *compound* hedges in both the *discussion* and *conclusion* sections of male and female writers' *RAs*.

Table 9. **Frequency and percentages of introductory phrases, if clauses, and compound hedges**

Hedging Devices	Male F %	Female F %	Total
Introductory Phrases	4 80	1 20	5
IF Clauses	9 56.2	7 43.7	16
Compound Hedges	32 61.5	20 38.5	52
Total	45	28	73

**F=Frequency*

The data analysis indicated that male authors employed more of these hedges in both the *discussion* and *conclusion* sections *(F=45*), as compared to female authors (*F=28*). However, the results indicated that both male and female authors used *compound* hedges more frequently (*F=52*) in comparison to *introductory phrases* (*F=5*), with *if clauses* in the middle (*F=16*). An independent t-test was conducted to find out any significant differences between the male and female writers in terms of these three types of hedges. Levene's Test for Equality of Variance showed statistical significance for *introductory phrases* between the two groups (*F=6.612*), (*P=.019*) and marginal significance for *if clauses* (*F=3.925*), (*P=.063*). As for *compound* hedges, there was no significant difference between the two groups (*P=.686*).

5. Discussion

With regard to the first research question of this paper, which addressed how frequently Saudi males and females employ hedges in *the discussion and conclusion* sections of their *RAs,* the overall results support previous studies (e.g., Behnam et al. 2012, Hashami & Shirzadi 2016, Hyland 1998, Salager-Meyer 1994, Varttala 2001) in that the *discussion* section is more heavily hedged compared to other sections in the RAs, including the *conclusion* section. The results of study

showed that the bulk of hedges in the written discourse of Saudi male and female researchers was located in the *discussion* section. The high occurrences of hedges in the *discussion* section were expected and reflected the rhetoric purpose of this section (Navrátilová 2013). A possible interpretation is that the *discussion* section is the place where writers emphasize their findings, state their own reading of the results in relation to other studies in the literature, attempt to avoid certainty and save the face of other fellow researchers. In this regard, Hyland (1998: 154) summarizes the motivation for the large number of hedges in the *discussion* section by stating that authors make their claims, consider relevance of results and speculate about what they might mean, going beyond their data to offer the more general interpretations by which they gain their academic credibility. The level of generality, and therefore the density of hedges, is much higher here, as writers explore the ramifications of their results.

Another possible interpretation of why the *discussion* section is heavily hedged is that it is usually longer and denser than the *conclusion* section as noted in the collected data of this study. In contrast, the *conclusion* section in the selected *RAs* ranged from one paragraph to five short paragraphs. This possibly made the use of hedges incomparable in number to the *discussion* section, which is usually a summary of the findings and hence researchers are not in a position to critically elaborate on the findings and make claims.

To answer the second research question, which was concerned with the types and frequencies of hedges used by Saudi male and female writers in the *discussion* and *conclusion* sections of their *RAs*, the results showed that *approximators* (e.g., degree: *frequently*, *sometimes; quantity: more, some; frequency: significantly, mainly; time: still, already*) were the most frequently used hedges in both sections. This result is consistent with previous studies such as those of Salager-Meyer's (1994) in that *approximators* are the most frequently used type of hedges in *RAs*. They are commonly used to manipulate precision in quantification, and *adverbs* of this type are also used to hedge the effect of the predicate, reducing the force of the verb.

Modal lexical verbs followed *approximators* as the second most commonly used hedges in the data. *Modal auxiliary verbs* came third. This result is consistent with the conclusions of Salager-Meyer (1994) and Serholt (2012) who found that *modal auxiliary verbs* (e.g., *may*, *can*, *could*, *would*, *might*, *should*, *must*) and *modal lexical verbs* (e.g., *seem*, *indicate*, *show*) are commonly used in *RAs*. These modals are usually used by writers to express doubt and evaluation of their results. They occurred in the data of this study as markers of tentativeness in reports of the writer´s own work and also indicated the limits to accuracy or applicability of the presented information. In several cases, they occurred in the sentences with inanimate subjects, such as *study*, *findings*, *data* or *results*.

The remaining hedges (*adjectival*, *adverbial*, and *nominal modal phrases*, *introductory phrases*, *if clauses*, *compound hedges*) were used less in the 20 *RAs*. This is inconsistent with Salager-Meyer's (1994) findings that *compound* hedges

are among the most frequently used hedges in discourse, and with Winardi's (2009) findings that showed high occurrences of *adjectival*, *adverbial*, and *nominal phrases*, *introductory phrases*. A possible interpretation of the limited number of these hedges in the current study is that they are "first and foremost the product of a mental attitude and a decision about the function of a span of language is bound to be subjective" (Salager-Meyer 1997: 108). That is to say, the use of these hedges is influenced by the author's way of thinking and subjectivity. Let alone, the sample used in this study was relatively small and its focus was only on the *discussion* and *conclusion*, which may have affected the actual number and distribution of hedges in the selected *RAs*.

As seen above in the data analysis, both *may* and *can* were found to be the most commonly used modal auxiliary verbs in the data. *Might* was found to be used less than *may* and other *modal auxiliary verbs* except *must*. According to Hyland (1996), *may* can be considered as having a less tentative meaning than *might*. Thus, *may* expresses that the probability of a claim being true is higher, but *might* conveys that the probability of a claim being true is lower. The most noticeable feature of this category of hedges in data was the high incidence of *can*, which was frequently employed in a way similar to *may* or *might*– to present the information less strongly. *Could* in its epistemic sense expresses a more tentative possibility than the non-epistemic *can*. The usage of *should* refers typically to the future and consequently has a more tentative meaning than *would* which means that it expresses a less confident assumption of probability based on known facts (Hyland 1996: 263). *Should* is used in the data to refer to a future event to mitigate their prediction in case it is proved to be wrong. The modal verb *must* had a perceptibly lower frequency in the data than the other modal verbs. *Must* is a marker for "inferential confidence" which would also explain why the modal is less used in the texts (Hyland 1996: 264). In other words, *must* is used by authors to judge the claim to be true. It reflects stronger commitment.

With regard to the third research question which was concerned with the effect of gender on the use hedging in the *discussion* and *conclusion* sections of Saudi authors' *RAs*, the findings should be approached with caution due to several reasons. First, the sample was relatively small because the number of Saudi females publishing in applied linguistics was relatively small at the time of conducting the study, which made it difficult to locate more studies. Second, as of today there has not been an agreement among researchers on what hedges are, which makes analyzing hedges and reaching conclusive interpretations a remote prospect (Varttala 2001). However, the results in general revealed variations with regard to gender differences in the use of hedges in Saudi academic discourse. The results did not show significant differences between male and female writers in their use of Salager-Meyer's (1997) taxonomy of hedges, except for certain hedges. The modal auxiliary verb *must* and the two modal lexical verbs *indicate* and *seem* were found to be used more by male writers. In contrast, female writers used more *adjectival*, *adverbial* and *nominal modal phrases* than male writers. However, the

overall results showed that male writers tended to use more hedges in six types of Salager-Meyer's (1997) taxonomy (*modal auxiliary verbs*, *modal lexical verbs*, *approximators*, *introductory phrases*, *if clauses*, and *compound* hedges). Therefore, the findings are not consistent with previous studies (e.g., Ansarin & Bathaie 2011, Lakoff 1975), which concluded that women use more hedges than men in their *RAs*. A possible interpretation of why Saudi male writers produced more hedges than female writers is that they produced detailed *discussion* and *conclusion,* allowing them to hedge more to make claims. Another possible reason could be a socio-cultural one. Saudi female researchers are new to publishing *RAs* in peered-review journals because Saudization of academic positions for women holding Ph.D. degrees in higher education took place a decade ago. The results of this study are consistent with the findings of Holmes (1995) and Serholt (2012), who concluded that men tended to use more hedges than women. However, it is not clear from the results why Saudi female authors used *adjectival*, *adverbial*, and *nominal modal phrases* more than their male counterparts. However, since these hedges reflect probability, it could be that Saudi female researchers used them as a matter of writing style not related to the use of hedges in written discourse.

6. Conclusion and implications

To conclude, this study examined the frequency, types and gendered use of hedges in academic written discourse by Saudi males and females using the theoretical framework of Salager-Meyer's (1997) taxonomy of hedges. It focused on two sections of their *RAs*: the *discussion* and *conclusion*. The overall results did not support Lakoff's (1975) claim that women tend to use more hedges than men in their language to soften and add uncertainty to their utterances. Lakoff and her proponents largely based their claim on oral communication skills "typically examining conversational dominance and largely concluding that men and women make different use of linguistic resources available to them in interactions" (Tse & Hyland 2008: 1233). The present study, along with other analogous research, indicates that the practice of hedging in RAs is influenced by a multitude of factors beyond mere gender. These factors encompass the researcher's socio-cultural background, discipline, and experience in publishing, amongst others.

This study has some important pedagogical implications for language instructors, particularly in second language and foreign language context. They suggest that graduate students should be acquainted with the role and importance of hedges in academic writing. Graduate students should be aware that learning to use hedges properly is an important communicative resource for them since hedges may help them develop academic arguments and establish a relationship with their discourse community. Furthermore, new researchers should be directed to use hedges more effectively to gain acceptance for their arguments by presenting appropriate and cautious statements as well as negotiating the perspective that helps their discussion and conclusions to be accepted by their fellow researchers.

This study only focused on Saudi male and female authors' use of hedges in Saudi written academic discourse drawn from the field of applied linguistics. Future research on the use of hedges should focus on comparative linguistic studies where the use of hedge is compared in different text genres (Yu & Wen 2022). That is, there is still a need for more research on how male and female writers use these hedges across disciplines such as medicine, education, science, etc. in order to better understand the relationship between gender and language use. Moreover, the current study relatively included a small sample of *RAs*, which may limit its findings to its context, and hence may not help us fully understand how gender may affect the use of hedges in written discourse. Therefore, larger samples of *RAs* are needed to help us better understand the assumed relationship between gender and hedging in academic writing.

CRediT authorship contribution statement

Lamya Alhuqbani: Conceptualization, Visualization, Data collection, Data analysis, Writing original draft; **Mohammed Alhuqbani:** Conceptualization, Critical revision of the manuscript, Proofreading, Supervision.

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