

Original Article

Transitivity Processes in Quantitative Versus Qualitative Applied Linguistics Research Articles' Discussions

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Abstract

Transitivity and its associated clausal semantic processes are assumed to bear textual representations of reality and encode authors' conceptions of the world in linguistic terms. Given this and the differential epistemologies featuring quantitative and qualitative research, the transitivity analysis of their associated academic reports gains salience. This study involved the comparative transitivity analysis of the discussion sections of 40 quantitative and qualitative applied linguistics research articles. Relative distributions of the six transitivity processes in systemic functional linguistics (relational, material, verbal, mental, existential, and behavioral) were investigated through a series of Chi-Square tests. Moreover, the most frequent processes in quantitative and qualitative discussions were in terms of their semantic associations. The results showed that mental, relational, and behavioral processes were the most frequent in both quantitative and qualitative discussions. In addition, qualitative research articles' discussions housed more mental and material processes, while quantitative research articles' discussions involved a significantly higher number of relational, verbal, and behavioral processes. However, frequent processes were semantically similar in the two corpora. The results are discussed regarding the ideological and generic associations of quantitative and qualitative research. The findings have implications for academic writing instruction and shed light on linguistically encoded reality in quantitative and qualitative research articles.

Keywords: Academic Discourse, Qualitative Articles, Quantitative Articles, Transitivity

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1. Introduction

Over recent decades, academic writing has been conceptualized (Hyland & Jiang, 2017). It is no longer an impersonal discourse domain; instead, it is viewed as a venue for interacting with readers and conveying one's stance toward content (Hyland, 2018). Taki and Jafarpour (2012) posit that academic writing involves transforming knowledge and deploying discourse tools. The author attracts the reader's attention to the significance and value of information in their work. Written academic discourse, including thesis, dissertations, and research articles (RAs), plays an essential role within the academic genre system. Membership in written field-specific academic discourse communities partly concerns familiarity with the functions such discourse is supposed to fulfill. According to Halliday (1985), These functions can be envisioned in the systemic functional linguistics (SFL) framework based on a three-way demarcation of ideational, interpersonal, and textual metafunctions. The present study focused on the ideational metafunction related to content-related lexicogrammar (lexis and transitivity). Six semantic processes are subsumed under transitivity in SFL and are equivalent to verbs in structural linguistics specified in their functions: relational, material, verbal, mental, existential, and behavioral. Transitivity can be defined as "a set of options whereby the speaker encodes his experience of his consciousness's external and internal world, together with the participants in these processes and their attendant circumstances" (Halliday, 1973, p. 134). According to Ammara et al. (2019), transitivity analysis helps unearth how language encompasses ideologies, subject matters, and meanings and how authors' inner and outer worlds are encoded in language.

Studies have addressed transitivity and the ideational metafunction in written and spoken discourse (e.g., Banks, 2010; Hadiyati et al., 2018; Kuswoyo & Rido, 2019; Zhang, 2017; Wahyuni et al., 2019). Research evidence is generally in favor of the significance of transitivity processes for achieving the generic, stylistic, and communicative goals of RAs and their constituent sections (Zheng, 2021; Zheng et al., 2014). However, the use of the six mentioned process types has not yet been researched in quantitative (Quan) and qualitative (Qual) research articles (RAs). These two sets of RAs are distinguished in terms of their underlying epistemologies: Unlike the inherent objectivity of Quan research, Qual research allows for subjectivity (Dornyei, 2007). The difference can be best captured by analyzing the discursual features of reports on them, most conspicuously their associated RAs. In other

words, it is essential to show how Quan and Qual research's differential ideologies are embodied in the academic discourse produced to report them.

Since ideologies are most visibly represented in RAs' discussions (Sheldon, 2019), their discourse features' analysis gains momentum. Jin (2021) pointed out that novice writers find the discussion section the most difficult to write among all RA sections due to their insufficient knowledge of genre-specific linguistic patterns. Likewise, Jalilifar (2011) noted that the difficulty researchers experience with writing the discussion section can be attributed to their "lack of awareness of the conventional rules of English rhetoric" (p. 177) and absence of explicit instruction on the discourse features of different sections of RAs in academic writing courses. One of the discourse features worth investigating in this arena is the set of semantic processes as part of the transitivity system in SFL. Moreover, the growing number of Qual RAs compared to Quan RAs in applied linguistics following the 1990s' social turn in the field (see Ortega, 2013) justifies the comparison. Such a comparison has implications for academic writing instruction and sheds light on epistemology-rooted discourse production.

2. Literature Review

As a constituent of social action and processes, discursive practice can be viewed as a guidepost to its associated discourse community's beliefs, values, and ideology (Flowerdew, 2012; Paltridge, 2006). From a social constructionist perspective, a discourse community's discursive practices are not only reflective of its basic ideology and epistemology but also constitutive of them (Flowerdew, 2012). Accordingly, the benefits of analyzing and understanding such practices are two-fold: (a) unearthing underlying thought systems and (b) making sense of the constructionist nature of thought systems because of the circulation and consumption of such discourse. Written academic discourse and its various subdomains, including Quan and Qual RAs, are no exception in this regard. Knowledge of academic discourse features would be an indispensable aspect of academic literacy required for those producing or using such discourse (Chalak & Norouzi, 2013; Defazio et al., 2010; Zheng, 2021). While written academic discourse has been generally analyzed in terms of complexity, formality, coherence, objectivity, explicitness, and hedging, two epistemologically different subdomains, including Quan and Qual RAs, are

also under-researched (Birhan, 2017). One venue through which epistemologically-laden discursive differences can be investigated is transitivity.

As an aspect of the ideational metafunction of clauses, transitivity has attracted research attention in the past decade. According to Wales (1989, P. 466), "transitivity is the sign-making technique influenced by subject, verb, and object." In other words, it is indicative of how the world is constituted in language use by authors and speakers (Berry, 1975; Christie & Derewianka, 2010; Zheng et al., 2014; Zheng, 2021). Halliday (1973) delineated transitivity in three clausal components: participants, processes, and circumstances. Processes, as the focus of the present study, are on a par with semantic verbs, which fall into six categories (Halliday, 1976, 1985): material processes (verbs of doing or happening); mental processes (verbs of sensing and thinking); behavioral processes (verbs of behaving); verbal processes (verbs of saying and stating); relational processes (verbs of being and having); and existential processes (verbs of existing) (see Methodology for examples). In the description of transitivity components, the context has been given a lot of weight by Matthiessen (1995).

Studies have been conducted on transitivity owing to its potential to provide nonnative learners with pedagogical insights. Transitivity has been analyzed in spoken discourse (e.g., analysis of presidential candidates' debate by Zhang (2017); analysis of engineering lectures by Kuswoyo and Rido (2019); and analysis of classroom discourse by Yuniar et al. (2017)). It has also been widely researched about written discourse (e.g., novel analysis by Song (2013); analysis of RAs in philosophy by Banks (2010); analysis of RAs in the *Nature* Journal by Nunn et al. (2018); analysis of EFL students' memoirs by Wahyuni et al. (2019); analysis of students' critical literary paragraphs by Hadiyati et al. (2018); analysis of students' recount texts by Senjawati (2016); analysis of English textbook in Indonesia by Emilia et al. (2017); analysis of transitivity shifts in EFL students' essay drafts by Lu (2012); and analysis of Iranian EFL learners' writings by Yazdani and Kamyabi Gol (2018)). These studies have generally provided evidence for quantitative and qualitative differences in transitivity processes across disciplines and genres, mostly explicable because of discourse-related communicative goals.

Martínez (2001) conducted a study on the impersonal composing style from a dataset comprised of 21 biologicals, social, and physical experimental research articles. He found that a pressure existed between the objectivity of the discoveries (through material

processes) and the degree of influence (through mental processes) created in each discipline. The researcher concluded that the impersonal style contained intransitivity, as evident in the frequent use of relational processes in the results and discussion moves where authors can "keep maximal distance" from the text (p. 241). Similarly, Zheng et al. (2014) conducted a corpus-based transitivity investigation concerning the six process types in clinical science RAs. Their study showed that the system of transitivity, more specifically the frequent use of material processes and the scarcity of mental, verbal, and existential processes, plays a fundamental part in understanding RAs' underlying philosophical perspectives.

Huang (2009) studied transitivity in 64 RAs written by international and Chinese researchers in applied linguistics along the same lines. She concluded that Chinese authors utilize transitivity processes differently from international authors, highlighting the implications of authors' nationality in this regard. Likewise, Behnam and Zamanian (2013) conducted a comparative study on transitivity in the abstracts of applied linguistics RAs published by Oxford University Press and a related journal in Iran. Analysis results showed the differential distribution of process types in the two corpora, which shows the constructionist role of different journals' editorial processes, even in the same field of study, for discursive practices. In another study, Marbun (2016) investigated transitivity processes in national geographic RAs. She found material processes to be the most frequent process type owing to the predominance of the human experience of physical activity in the field. In a more recent study, Zheng (2021) investigated transitivity processes' distribution in the different sections of 10 applied linguistics RAs published in distinguished discipline journals. The results showed significant differences, which the author attributed to the RA sections' rhetorical and stylistic features. While material and relational processes were mainly used for the informational function, mental and verbal processes conveyed the argumentative and persuasive sense of propositions. This study, however, involved no demarcation between Quan and Qual RAs and overgeneralized the findings to both. Similar studies demonstrated the significance of transitivity analysis in understanding the authors' intentions and epistemologies in the academic discourse.

One significantly under-researched area of written academic discourse in which ideological and epistemological differences conspicuously surface is Quan and Qual RAs (Creswell, 2003). Quan and Qual studies are ideologically different. Unlike the pre-ordained and objective design of Quan research, Qual research is marked by the researcher's

subjective interpretation of the issue under investigation (Dornyei, 2007). Quan researchers "examine causes that influence outcomes" (Creswell, 2003, p. 5).

On the other hand, Qual research envisages reality as multiple and socially constructed, wherein interpretations are subjectively made (Creswell, 2003; Taylor et al., 2015). The difference could be analyzed regarding SFL's posited metafunctions, including the ideational metafunction and transitivity as an aspect of its associated lexicogrammar. The foremost venue for the differential use of transitivity processes is the discussion section, presenting the authors' interpretations of their results. The findings justified the link between ideological and epistemological perspectives (Berry, 1975; Sheldon, 2019; Zheng, 2021). Quan studies are located in sharp epistemological opposition to qualitative studies, which is evident in purists' role in disregarding one in desire of the other (Creswell & Poth, 2013; Dornyei, 2007). Related to the issues of the current study, Choy (2014) believes that Qual studies offer a much wider space for articulating writers' subjective interpretation of the results.

In contrast, Quan studies aim for generalizability and impersonality. The former capitalizes on individual meaning, whereas the latter focuses on group-related and normalized meaning. Sukamolson (2007, p. 5) claims "qualitative researchers are subjectivists," which stands in sharp contrast to the objectivity inherent in Quan studies. Accordingly, it is worth investigating how transitivity implicates reflecting and constituting such differences, particularly in their discussion sections, where authors' attitudes and interpretations are most evidently expressed. The following questions were put forth:

1. Is there a significant difference between quantitative and qualitative research articles' discussions regarding the use frequency of SFL-based semantic process types?
2. How does the choice of transitivity processes in the six process categories differ in quantitative and qualitative research articles' discussions with an eye to their inherent agency and subjectivity?

3. Methodology

This study was designed to (a) investigate the use frequency of the six transitivity process types in Quan and Qual RAs' discussion sections and (b) qualitatively compare the most frequent process types in Quan and Qual discussions in terms of the semantic features of agency and subjectivity. To this end, the researchers compiled the corpus and manually

detected and analyzed process tokens (relational, material, mental, verbal, existential, and behavioral). Definitions and examples of the six process types are as follows:

1. *Material process*: As Halliday and Martin (1993) stated, material processes embody an action verb of doing or happening; they show the truth of doing and portray circumstances expressed through physical acts (e.g., kiss, run, and cook).
2. *Mental process*: Mental or internalized processes are to do with sensing and thinking and are subcategorized into understanding (e.g., seeing, feeling), response (e.g., hating, loving), and cognition (imagining, knowing) processes (e.g., see, hear, feel, and think) (Halliday & Matthiessen, 2004).
3. *Behavioral process*: Behavioral processes are verbs of behavior that lie between material and mental processes. They are infrequent in academic writing because of their focal behavioral essence (Halliday & Martin, 1993). Such processes also involve typical human physiological behaviors (e.g., smiling, breathing, and laughing) (Halliday & Matthiessen, 2004).
4. *Verbal process*: Verbal processes involve saying and stating (e.g., tell, argue, and say) (Halliday & Matthiessen, 2004).
5. *Relational process*: As Halliday and Matthiessen (2004) mentioned, relational process statements contain the sense of being and having and fall into the two categories of identifying and attributive processes. The former involves identifying an entity with a parallel entity (e.g., get, seem and become), and the latter consists in assigning an attribute to an entity (e.g., indicate, illustrate, and represent)
6. *Existential process*: According to Halliday and Martin (1993), existential process statements are related to existing (e.g., there is, and exist)

This section provides information on the corpus and the data analysis procedure.

3.1. Design and Context of the Study

The study employed an ex post facto design, detecting the six process types in the compiled corpus in 2019 at Islamic Azad University (South Tehran Branch). Corpus compilation was carried out by one of the authors, and the other authors guided analyses of transitivity processes. Studies were carried out based on Halliday & Martin's (1993) theoretical framework distinguishing six transitivity process types. There exists no exhaustive list of processes belonging to each of the six categories. Therefore, ratings were done following a short training session, and ambiguous cases faced by raters during the

analysis process were subsequently discussed and agreement reached (see Data Analysis Procedure).

3.2. Data Collection Procedure: Corpus Compilation

Corpus compilation involved the random selection of three reputable journals in the field of applied linguistics (indexed in the Web of Science Core Collection, with an impact score beyond 1 (Q1) from 2017 to 2020):

1. Language Awareness (published by Taylor & Francis Ltd.)
2. Language Teaching Research (published by Sage Publications)
3. TESOL Quarterly (published by Wiley-Blackwell)

Forty papers (20 Quan and 20 Qual) published in these three journals from 2017 to 2020 were randomly selected from a bank of 127 RAs. The 127 RAs met the following criteria:

1. They were all single-authored, but the nationality of the authors was not controlled.
2. They had a distinct discussion section.
3. They involved either Quan data and analysis or Qual data and analysis. Mixed-methods RAs were omitted.
4. Their topics were exclusively related to second language acquisition.

As for sampling adequacy, the decision to include roughly one-third of the 127 RAs meeting the just-mentioned criteria was made based on (a) the related research tradition (e.g., Jalilifar, 2011; Zheng, 2021), and (b) feasibility concerns. Regarding the study's focus, the discussion section of each of the selected RAs was subjected to process detection and process choice analysis. Discussions totaled 46036 words (22984 words for Quan and 23052 for Qual articles).

3.3. Data Analysis Procedure

Two of the researchers manually analyzed the corpora following a debriefing session. Initially, both corpora were dissected into their constituent clauses as the basic unit of analysis in SFL. Subsequently, following Kanoksilapatham's (2005) guidelines, three researchers randomly and independently coded a quarter of both datasets after a 60-minute training session by an assistant professor of applied linguistics specializing in discourse analysis. The analysis was done based on directed qualitative content analysis (DQCA), assigning detected cases in the data to a priori categories (Mayring, 2014). Assigning process types was not completely straightforward as some clauses could be interpreted under more

than one category, contingent upon metaphorical meanings or ad hoc contexts (Flowerdew, 2012; Halliday & Martin, 1993; Martínez, 2001). For example, the clause *Teachers play a critical role* is constructed upon the material process *play*.

In contrast, the meaning is symbolic since this idiomatic phrase means *include* represents a relational process. To counter subjectivity steps to ensure inter-coder agreement were taken. The inter-coder agreement was calculated, and a Cohen's kappa coefficient of .76 indicated acceptable reliability. The coders discussed disagreements in a subsequent session, and agreements were reached. One-third of the remaining corpus was analyzed for tokens of the six process types by each of the three coders. Ambiguous instances were recorded and discussed all along to the point of unanimity. Following are some examples:

A. Examples from the Quan corpus:

- a. Interestingly, other students also *made* material sculptures that *reflected* their interests, religious backgrounds, or friendships.
- b. This view *is supported* mentally by Whitehurst and Vasta (1975), who *argue* verbally that an implicit focus on form *is* relational only a first step.

B. Examples from the Qual corpus:

- a. A great deal of the power of this activity *was* relational to the diverse ways in which students dramatically *interpreted* mental the exercise.
- b. Lobsang *used* material in different languages from the handout, as did Mei, whose statue *was made* of material to *commemorate* mental a character in a favorite novel.

4. Results

Six chi-square tests of independence were run to determine how Quan and Qual RA discussions differ in the six transitivity process types (i.e., relational, material, behavioral, verbal, existential, and mental). Table 1 shows the number and percentage of each of the six process types in the Qual and Quan discussion corpora. The percentages have also been graphically represented in Figure 1. As the numbers indicate, mental processes had the largest share in Quan RA discussions, followed by relational processes. Behavioral processes came in third, followed by verbal, material, and existential processes. As for Qual discussions, mental processes constituted the most frequent category, followed by relational

processes. Behavioral, material, verbal, and existential processes are followed in descending frequency order. It can be observed that in both Quan and Qual corpora, verbal and existential processes were the most and the least frequent process types, respectively; moreover, the second most frequent process type in both (i.e., the behavioral process) occupied the second position by a wide margin from the first (i.e., the mental process).

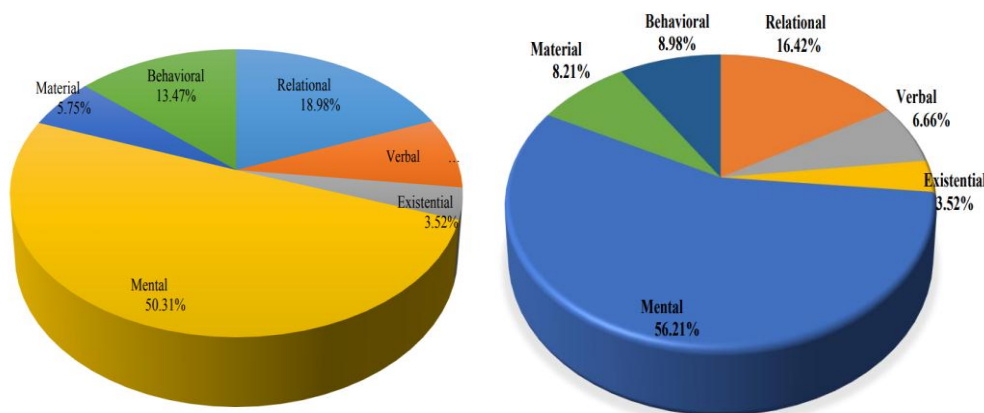
Table 1

Frequency of Process Types in Quan and Qual RA Discussions

Corpus		Process types						Total
		Mental	Relational	Behavioral	Material	Verbal	Existential	
Quan	Number	1042	393	279	119	165	73	2071
	Percentage	50.31	18.97	13.47	5.74	7.96	3.52	100
Qual	Number	1164	340	186	170	138	73	2071
	Percentage	56.20	16.41	8.98	8.20	6.66	3.52	100

Figure 1.

Pie Charts of Quan and Qual RA Discussions' Transitivity Process Types



After determining the number and percentage of the six process types in each corpus, they were compared at the .01 significance level through Chi-square tests. Table 1 shows the results. Significant differences were detected for *relational* processes ($\chi^2 = 17.27$; $p < .01$; $\Phi = 0.65$), *verbal* processes ($\chi^2 = 11.89$; $p < .01$; $\Phi = 0.54$), *mental* processes ($\chi^2 = 19.09$; $p < .01$; $\Phi = 0.69$), *material* processes ($\chi^2 = 24.20$; $p < .01$; $\Phi = 0.77$) and *behavioral* processes ($\chi^2 = 34.00$; $p < .01$; $\Phi = 0.90$). However, no statistically significant difference was observed

for *existential* processes ($\chi^2 = 5.39$; $p > .01$). The effect sizes in both cases were also calculated through Phi correlation. Based on the results, the effect sizes for relational, mental, material, and behavioral were substantial, indicating strong associations. The effect size for verbal was .54, indicating a moderate association. Accordingly, Qual RA discussions contained a statistically significant number of mental and material processes, while Quan RA discussions embedded a greater number of relational, verbal, and behavioral processes, and the differences reached statistical significance.

Table 2.
Chi-Square Tests for Qualitative and Quantitative Articles

Process Type	Pearson Chi-Square	Df	Sig.	Phi Correlation
Relational	17.27	8	.00	0.65
Verbal	11.89	8	.01	0.54
Existential	5.39	9	.79	0.36
Mental	19.09	15	.00	0.69
Material	24.20	13	.01	0.77
Behavioral	34.00	11	.00	0.90

The second research question was answered through the qualitative analysis of the three most frequent processes in each of the six categories in the two Quan and Qual corpora (see Table 3). The comparison focused on the processes' potential to convey authors' agency and subjectivity. The analysis was limited to agency and subjectivity because of Quan and Qual's distinctions in these terms. While Quan research findings are often discussed against existing research, Qual research discussions generally involve researchers' subjective and agentive interpretation. It was hypothesized that this could also feature in the choice of transitivity processes in each of the six categories.

Table 3 indicates no relational and existential processes difference, involving roughly identical processes. Regarding material processes, while *use* and *carry out* were commonly used in both corpora, *shown* in Quan discussions and *created* in Qual discussions can be assigned differential agentive underpinnings: *Showing* conveys a lack of agency but *creating* alludes to the author's subjective stance. As for verbal processes, *arguing and suggesting* were frequent in both Quan and Qual discussions, but *stating intuitively* in Quan discussions conveys less agency and subjectivity than *discussing*. The two-process categories wherein the three most frequent processes were different were mental and behavioral. Mental processes in Quan discussions were mainly used to either report other studies' findings (*find*

out) or juxtapose one's findings with those of others (*support* and *reflect*). On the other hand, Qual discussions involved the more agentive and subjective evaluation, interpretation, and analysis processes. Regarding behavioral processes, Quan discussions provide the diverging or non-diverging evidence, *arrangement*, and *summarization* which are more objective and less agentive than *experiencing*, *theme extraction*, and *inquiry*.

Overall, in answer to the second research question, it could be stated that the ideological differences of Quan and Qual research are evident in their choice of processes within each of the six transitivity process categories. Differences are more evidently detectable concerning mental, behavioral, verbal, and material processes in descending order of distinctiveness.

Table 3.

Most Frequent Processes in Quantitative and Qualitative Discussions

Corpus	Process types					
	Mental	Relational	Behavioral	Material	Verbal	Existential
Quan discussions	support, find out, reflect	is, was, seem	provide, arrange, summarize	show, use, carry out	argue, suggest, state	there is, there was, there were
Qual discussions	evaluate, analyze, interpret	is, was, were	experience, extract, inquire	use, create, carry out	argue, discuss, suggest	there is, there was, there were

5. Discussion

This corpus-based investigation was conducted to unearth the differential use of transitivity processes in Quan and Qual RA discussions. The results showed that mental, relational, and behavioral processes were the first three most frequently used process types in both Quan and Qual RA discussions. Comparatively, significant differences were detected in five of the process types, with mental and material processes being more frequent in Qual RA discussions and relational, verbal, and behavioral processes used more frequently in Quan RA discussions; existential processes. It is in line with Zheng's (2021) finding regarding their low frequency in all RA sections. In addition, the qualitative analysis of the choice of processes in Quan and Qual discussions showed the greater agency and subjectivity conveyed by mental, behavioral, verbal, and material processes in the latter.

That mental processes were most frequent in both Quan and Qual RA discussions can be attributed to the main generic communicative purpose of RA discussions: persuasive argumentation. Sketching the moves of Qual RA discussions, Dobakhti (2016) pointed to the importance of data- or literature-supported explanation and interpretation as the skeletal plot of discussions. Such explanation and interpretation should also be rhetorically composed in a persuasive fashion (Hyland, 2003). The predominant use of mental processes (e.g., *interpret, justify, refute, support, and evaluate*) for persuasion finds support in Zheng et al. (2014), who showed the preliminary use of mental processes for persuasive purposes in RAs in a variety of fields. Zheng (2021), too, pinpointed the persuasive potential of mental processes, particularly serving the argumentative function of the RA discussion section.

Furthermore, the frequency of relational and behavioral processes followed mental processes in both Quan and Qual RA discussions could be justified concerning one of the major moves of RA discussions, viz., continuous reference to data or the literature to support or explain one's findings (Holmes, 2001; Vathanalaotha & Tangkiengsirisin, 2018)). This move involves, among others, juxtaposing findings with existing similar or contradictory research evidence. Accordingly, attributive relational clauses (e.g., *The findings are similar to, on a par with, congruent with, contradictory to...*), identifying relational clauses (e.g., *This result is what X came up with.*), and behavioral clauses (e.g., *The results find support in X; Existing research in this regard has undergone a critical meta-analysis by X*) were frequent, irrespective of the Quan or Qual nature of the research. These two process types can be said to fulfill the information provision function, which Jin (2021) mentioned as one of the salient linguistic patterns in the RA discussion section.

It should be noted that compared with mental processes, relational and behavioral processes constituted a small proportion of all the processes in both corpora. This indicates that authors were more concerned with persuasive explanation and interpretation of their data or existing evidence than recounting the implicating aspects of their data or points of unity or incongruence with existing research evidence. In this regard, Halliday and Martin (1993) stated that behavioral processes are uncommon in scientific writing. Zheng et al. (2014) and Martínez's (2001) found material processes among the most frequently used process types in scientific RAs. However, since their studies embodied a range of fields and all sections of RAs, the conclusion might not apply to particular majors, including applied linguistics, and specific sections of RAs, including the discussion section.

Comparatively, Qual RA discussions housed a significantly higher number of mental processes. This observation can be explained in Qual research's quest for a thick description of the phenomenon under investigation. The researcher adopts an agentive role in giving "meaning to the raw data" (Struwig & Stead, 2007, p. 172). Accordingly, Qual researchers can be said to have been compelled to use linguistic devices which would aid them in driving forth their stance on the data. In this study, mental processes seem to have fulfilled this effectual drive. Mental processes were also seemingly employed to create the persuasive force of Qual RA discussions. However, owing to Qual research's quest for generalizability and objectivity, researchers might not have relied on the persuasive force of mental processes as far as Qual researchers in the composition of their discussions. In addition to mental processes, material processes were also used more frequently in Qual RA discussions. The more frequent use of material processes in Qual RAs is explicable concerning Qual researchers' frequent foregrounding of their data in their discussions to push their interpretation (Arsyad, 2013; Dobakhti, 2016; Sheldon, 2019; Zheng, 2021). Qual data are collected and analyzed through more action-reliant means (e.g., observation, interview, and manual data analysis (Taylor et al., 2015), and reference to them in the discussion indispensably impinges on the use of material processes. Accordingly, unlike Qual researchers, Qual researchers are more engaged in *interviewing, observing, field-noting, audio- or video-recording*. A closer inspection of the corpora showed the density of material processes in the first paragraph of Qual RA discussions, where authors summarized their findings (e.g., *The interviews were carried out...*), though frequent cross-references to data were also detected. This statement finds support in Dobakhti (2016). Her study found Qual RA discussions in applied linguistics to house frequent references to data for persuasive purposes.

This study also showed that Qual RA discussions made more frequent relational, verbal, and behavioral processes than their Qual counterparts. Qual researchers used both attributive and identified relational processes to explain their findings with existing research evidence (e.g., *The results are in keeping with; This finding parallels X's results.*). These with verbal clauses are used to quote theorists and practitioners featured in the related literature work to accentuate the objectivity and generalizability quest of Qual research (Creswell, 2013). While discussing their findings, Qual authors seem to have mainly aimed to justify their findings against the backdrop of available research rather than referring to

their data to explain their stance, which is common practice in Qual research (Arsyad, 2013). These processes were not as frequent in the Qual corpus, which can be attributed to the importance of the authors' interpretive perspective on the data over existing theory and research. A good deal of Qual research begins not with a priori themes or categories (except what is common in directed qualitative content analysis) but with iterative data collection and analysis to theorize (Dornyei, 2007). Accordingly, quoting, which invokes verbal processes, and juxtaposing findings with existing theory and research, which invokes relational processes, would not be as significant in Qual RA discussions as in Quan RA discussions. Behavioral processes were also frequently used in Quan RA discussions, attributed to their intermediary position between mental and material processes (e.g., *observe*). Behavioral processes might have aided Quan authors in discussing their findings without subscribing to the overarching subjective and interpretive aura of Qual research (which is embodied in mental processes) by adding a material aspect to their interpretations. This way, they might have aimed to maintain the inherent objectivity of their argumentation.

Finally, the qualitative analysis of the choice of processes within the six categories showed differences in the processes' semantic aspects of agency and subjectivity. Qual authors conveyed their subjectivity with more agentive and subjective associations than Quan authors. This difference can be explained by Quan research's inherent objectivity and Qual research's inherent subjectivity. Quan RAs' authors tended to distance themselves from the findings to accentuate their unbiased, evidence-based explanation and justification. Qual RAs' authors, on the other hand, brought to the forefront their belief in the legitimacy of researchers' agency and subjective interpretations in their choice of processes. That relational and existential processes did not differ is explicable concerning these two categories' limited range of processes. Based on the results, the choice of the processes can aid authors in achieving the communicative purpose(s). In this regard, Liu and Buckingham (2018) found significant differences in the use of textual and interpersonal discourse markers across the moves of the applied linguistics RAs' discussions. This observation can be attributed to the moves' distinct communicative purposes. As Chalak & Dehghan (2016) pointed out, academic writing demands knowledge of both structural and communicative organizing devices. As the present study is concerned, communicatively well-organized texts are partly created through appropriate discourse tools, including transitivity processes.

6. Conclusion

Most existing discourse analytic research on RA discussions has capitalized on substantiating their moves across different fields of study (see Arsyad, 2013). However, how discourse implicitly contributes to or reflects the ideology underpinning different types of research, including Quan and Qual, has received scant attention in applied linguistics research. Based on the results, it can be concluded that envisioning RAs within an SFL framework can shed light on how to implicate dimensions of academic research in their associated academic reports. As the present study's focus, the transitivity system enables authors to represent their experiences and perceptions of reality (Bloor & Bloor, 1995). Such perceptions gain salience in RA discussions of Quan and Qual research, which carry epistemologically and ideologically distinct properties.

The predominance of mental and material processes in Qual RA discussions is indicative of the primacy of data-based, rather than literature-based, persuasive interpretations. On the other hand, the higher frequency of verbal, relational, and behavioral processes in Quan RA discussions reflects the premium such research places on objectively justifying findings concerning existing theory and research. An awareness of the detected differential deployment of SFL process types in the Quan and Qual corpora can benefit writing instructors, learners, and writing material developers. Writing instruction can be tuned to incorporate awareness-raising tasks on (a) the function of different process types in Quan and Qual RA discussions (i.e., driving subjective interpretations or forcing objectivity and generalizability), and (b) the hidden implications of the use of the six process types for shaping the generic features of such discussions. By developing this awareness, learners will be equipped to join the academic discourse community in applied linguistics more smoothly. Writing materials can also be developed to direct learners' attention to such rarely-treated aspects of academic writing as transitivity processes. There is research evidence in favor of SFL-based writing instruction. Yousefi Osguee et al. (2019) found SFL-oriented register instruction effective for Iranian EFL learners' writing proficiency development. They pointed to the need to "supersede traditional linguistic-based writing instruction by a contextual and situational teaching methodology" (p. 156).

The study admittedly involved a rather small corpus. Replication with a larger corpus from a wider variety of journals while controlling for the nationality, gender, and the number of authors of the selected papers (Quan, Qual, or mixed) could lead to more reliable

findings regarding the working of the transitivity system in RA discussions. In addition, a qualitative analysis of the move-based positioning of the six process types in RA discussions and other sections of Quan, Qual, and mixed-methods RAs could further contribute to this line of research.

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