

# Journal of Development and Social Sciences www.jdss.org.pk

### **RESEARCH PAPER**

## Transitivity Analysis: A Study of Protagonist's Identity Shift in Short Story 'Bingo' Written in the Perspective of Dhaka Fall 1971

Amina Shahzadi<sup>1</sup> Nusrat Sultana<sup>2</sup> Dr. Abdul Ghaffar Bhatti<sup>3</sup>

- 1. Lecturer, Department of English, University of Education, Lahore, Multan Campus, Punjab, Pakistan
- 2. Lecturer, Department of English, University of Education, Lahore, Multan Campus, Punjab, Pakistan
- 3. Associate Professor, Department of English, University of Education, Lahore, Multan Campus, Punjab, Pakistan

PAPER INFO	ABSTRACT
Received:	Language is the medium for representing identities and ideologies of
February 08, 2022	individuals in a socio-cultural context. This function of language gives
Accepted:	the potential to narratives to represent the identity of the character
April 10, 2022	by making use of specific linguistic choices. This paper aims at
Online:	examining the protagonist's identity shift in Tariq Rehman's short
April 15 , 2022	story 'Bingo' written in the socio-political milieu of Dhaka Fall.
Keywords:	Halliday's transitivity model (1986) embedded in Systemic
Identity,	
Narratives,	Functional Grammar is used as a framework to highlight the actions,
Systemic Functional	thought processes, and relations of the protagonist in changing the
Grammar,	socio-political context of 1971 which in turn helps to construe the
Transitivity Analysis	identity of the individual. The analysis reveals a shift in the
*Corresponding	protagonist's identity as the incident of the 1971 war and his
Author:	personal experiences of the war caused a significant change in his
nusrat.sultana@ue.	character from passive recipient to be the actor of material processes
edu.pk	and his increased involvement in mental processes.

#### Introduction

Language is a tool of communication that provides humans the opportunity to convey their intended meanings by making lexico-grammatical choices. Fairclough (2001) also considers language as a "material form of ideology and language is invested by ideology" (p.73). Language is a powerful mechanism that represents the experiences of the individuals which are shaped by their actions, thoughts, behaviours and level of discernment. Thereby, language represents the patterns of experience in the texts performing the experiential function which is an important feature of the style of narratives. This feature of language enables the narrative to represent the ideologies and identities of the characters; and readers can construe the identity of the characters in the narratives through different physiological actions and psychological behaviors.

This paper aims to examine the identity shift of the protagonist i.e. main character in the short story 'Bingo' written by Tariq Rehman in the context of Dhaka Fall. The present study is significant because it helps understand the characters identity shift with special reference to 1971 Indo-Pakistan war. It investigates identity shift in the story 'Bingo' with reference to two separate periods of 1971: before war and after war. Simultaneously, it helps discern 4 stages of human identity transformation proposed by Marcia (1996) i.e. (1) identity diffusion, (2) identity foreclosure, (3) identity moratorium (4) identity achievement. We get insight into character transformation stepwise from identity diffusion to identity achievement by analyzing the actions and behaviours of the protagonist.

The recent study is unique because it analyzes the process of identity transformation of characters with special reference to time of war. It is an attempt to achieve an insight into the identity transformation process of protagonist, 'Safeer' who undergoes a long trial from identity diffusion to identity achievement. Additionally, it is mostly harder to understand the internal and psychological transformation and intensions of the characters, but transitivity analysis makes it easier as it analyzes and relates the participants, their processes, circumstances, beneficiaries and goals to conceive meanings. For this purpose, Halliday's transitivity model (1986) embedded in systemic functional grammar is used as a framework. Transitivity analysis facilitates to highlight the meanings encoded in the clauses and the transitivity processes represented in the language reveal who did what to whom which help to understand the identity formation as well as identity shift of the characters in narratives.

#### **Literature Review**

Halliday's Systemic Functional Grammar (1986) considers language as a system that operates in the form of a network. Systemic Functional Grammar (SFG) framework facilitates the discourse analysis by focusing on social, semiotics as well as the functional aspects of language. Therefore, it is used to analyze both literary and non-literary texts. Within SFG, Halliday elaborates three main functions of language called the meta-functions. These are ideational, interpersonal, and textual functions. Halliday's (1981) classification of grammar into three types further explains how these metafunctions are performed by language. According to Halliday, *theme* is the grammar of discourse which fulfills the textual function; *mood*, the grammar of speech performs the interpersonal function of language and *transitivity* is the grammar of experience and performs the ideational function. The ideational function of language represents patterns of experience of the world and allows an individual to understand their experience of what goes on around and inside them. This reflective experiential feature of meaning is called transitivity. So, the transitivity analysis within the ideational metafunction is used to explore the experiential meaning within a text.

Transitivity is a semantic concept introduced by Halliday (1986) and is used for the analysis of representation in a text. Significantly social structures and values entail specific patterns of transitivity. Simpson affirms that "transitivity refers to the way meanings are encoded in the clause and the way different types of processes are represented in the language". (2004, p. 22). According to the transitivity system, our experiences of life consist of "goings-on – happening, doing, sensing, meaning, being and becoming" (Halliday, 1994.106), which are shared by people through clauses that make up the language. People express themselves in particular ways due to their life experiences which in the transitivity system are called processes.

Transitivity processes have three components which are process, participant, and circumstances. Halliday (1986) identified six types of processes. *Material processes* are also called the processes of 'doing' as in walking, writing, etc. *The mental process* is the second important process of the transitivity model and is referred as the process of 'sensing', which includes cognition, perception, and reactions. *Behavioral processes* represent both the activities of 'sensing and doing' and involve processes like 'breathe', 'cough', 'smile', 'laugh' etc. *Verbal processes* are the articulation of the conscious thoughts and are the processes of 'saying' e.g. 'claimed', 'announced', 'asked', 'said' etc. *Relational processes* are the processes of 'being' and are of three types i.e. intensive, possessive, and circumstantial. *Existential* processes are the last category of the system of transitivity which are used to refer to the existence of something and are identified by the use 'there'.

In the narratives, transmission of actions and events is the principle means of characterization. The transitivity model enables to identify the way the character is developed through and by the semantic processes and participant roles embedded in narratives. Emphasizing the role of linguistic choices in the character development, Fairclough states that "the representation of social actors involves a number of choices, including activated/passivated, personal/impersonal, named/classified, and generic/specific as well as exclusion or inclusion, and using pronouns as opposed to nouns" (2004:155). Thereby, narratives represent different social events and the actions of the character which reveal the identity of the character using processes, participants and circumstances manifested in different linguistic choices. Identity, on the other hand, is a reflexive and dynamic social construct which is the product of the social, historical, and political contexts of an individual's experiences. Ochs (2005) further establishes that social identity includes participant roles, positions, relationships, reputations, and other facets of social actors.

Previously, transitivity framework was used by different researchers to analyze the literary and non-literary texts. Polovina-Vukovic (2004) employed transitivity analysis to identify the representation of social actors in media discourse. On the other hand, Abdullah (2004) used the transitivity framework to study the representation of Malaysian national identity. Nguyen (2012) applied the transitivity model on a novel and concluded that the use of this framework is not only helpful in the interpretation of the literary text but also the identification of the ideologies of the main character. Rizwan (2013) conducted a study on Urdu short stories through transitivity analysis to highlight the representation of main characters to reveal their socio-cultural identity in Indo-Pakistani social context. Monika Kavalir (2016) tried Halliday's model of transitivity to investigat the contribution of both the ideational and the interpersonal metafunctions to the meaning incorporated in James Joyce's 'Eveline'. Niyati Wulandari (2016) analyzed clauses of two versions of Cindrella stories and found meaningful findings from transitivity analysis. Qasim, et, al. (2018) utilized transitivity model to analyze linguistic choices by main characters of 'The Reluctant Fundamentalist' by Mohsin Hamid. Similarly, Ahmad (2019) applied transitivity model to investigate the linguistic choices of the characters portrayed in 'The Happy Prince by Oscar Wilde. Some other researchers like Cunanan (2011), Song (2013), Mehmood et al. (2014), have also applied transitivity model to their research work and they have declared it a wonderful angle of qualitative linguistic investigation.

The application of transitivity model has revolutionized the field of qualitative research (Ahmad, 2019; Cunnan, 2011; Mehmood et al. 2014; Song, 2013). The model helped elaborate meanings in fiction and non-fiction text. Moreover, it adds reliability in research work. The particular issues of identity, representations, psychology, socio-cultural issues and all trivialities are discerned and decoded in a much better way through Halliday's model. This model is applied to the present research work also. The analysis of material, verbal, mental, processes and characters through this framework reciprocates the purpose of the present research.

#### **Material and Methods**

In this study, Halliday's transitivity model embedded in Systemic Functional Grammar is used as a tool for a close textual analysis of a short story to identify main character's identity shift during the events in the story. The short story 'Bingo' written by Tariq Ali in the backdrop of Dhaka Fall (1971) is selected for this purpose. This story revolves around the people of two nations – Pakistan and Bangladesh. 'Safeer' is the main character who represents West Pakistan and 'Tajassur' represents East Pakistan. 'Bingo' means 'traitor' and it is a coinage by Tariq Rehman used especially for East Pakistan people (traitors). The hatred of East Pakistan (Bangladesh) for West Pakistan has been expressed from military point of view. Safeer and Tajassur are friends and undergo a military training. At the age of 19 both of them were appointed as Military Govt officers. Tajassur was heartbroken at abusive remarks off and on passed about him and his Bangladeshi people by high officials of Pakistan military. Safeer's was also of the same views about Bangladeshi

people in the first part of the story as he is going through leaning and identity shift processes. Subsequently, in second part of the story, his training and learning from co-participants alter his rigid identity. He develops acceptability for them as opposed to popularized ideology of Pakistan military. In the end of the story, he utterances, behaviours and actions display his identity achievement stage. The murder of Tajassur, rape of Tajassur's sister as traitors in his presence changed his views about Bangladeshi people. The story ends in identity transformation of Safeer towards created ideology of Pakistani military towards Bangladeshi people as traitors. He learns to perceive through his personal experiences. The focus of the analysis is to interpret the change in the identity of the main character i.e. protagonist Safeer before and after 1971 war. Firstly, the short story is divided into two parts based on the events before the war and after the war to recognize the changes and developments in the main character's actions, thought processes, feelings, and behavior.

Halliday and Mathiessen (2004) identify three elements of the clause by sequencing the processes at the most important position, the participants at the second and the circumstances at the third. The first part of the story presents the transitivity processes of 'Safeer', the protagonist, before the historic events of Dhaka Fall when he was in the Pakistan military academy along with his Bengali friend Tjassur. The processes in the second part of the story deals with the events after he is arrested during the 1971 war by the Bingos (Bangla Liberation Army) and passes through a crisis. Furthermore, the text is divided into clauses which involve the processes and the participants of the processes. There are 396 clauses in part 1 and 240 clauses in second part of the story which make up total 636 clauses in the short story. The clauses are numbered in order of their occurrence in the story and are labeled in compliance with the model of transitivity presented by Halliday (1994) and (1997) according to the process type i.e. material, mental, relational, behavioral, verbal, and existential. The frequency for each process type was counted manually and presented in the form of a table. The processes of both parts of the story were compared to spot the changes in Safeer's character reflecting the shift in his identity.

### **Results and Discussion**

### Data Analysis

At this stage, after data collection and tabulation of data, it is vivid that the story 'Bingo' involves an exploration of transformational stages of the protagonist. The analysis of data indicates that the processes and actions of the protagonist exhibit changes taking place from part 1 of the story to part 2. 'Safeer', the protagonist, thinks, feels and learns to react according to his own perception and learning. The tabulated data further explains the following details.

Table 1 presents the frequency and percentage of different types of transitivity processes before the war and during the war in part 2 of the story. In the first half of the story, there are 29 % material, 19.7 % verbal, 14.9 % behavioral and 16.7% relational processes. The occurrence of more material and behavioral processes indicates more actions and behaviors of different characters in part 1. In part 2, there are 32 % mental processes, 24.3% material processes, and 18.8 % verbal processes. Table 1, therefore, highlights that before the war, material processes are dominant and during the, there is more use of mental processes in the story which highlights a shift of focus from actions to the thinking and feelings of the characters in the short story.

 Table 1

 Transitivity processes in short story 'Bingo'

	Part 1		Part 2		
Process	Frequency	Percentage	Frequency	Percentage	

Journal of Development and Social Sciences (JDSS)

April-June, 2022 Volume 3, Issue 2

Material	115	29%	58	24.3%
Mental	66	16.7%	77	32%
Relational	74	18.7%	35	14.6%
Behavioral	58	14.9%	16	6.7%
Verbal	79	19.7%	44	18.8%
Existential	4	1%	8	3.3%
Total	396		239	

Table 2 presents different processes related to Safeer who is the protagonist in this short story. It is revealed that more material processes (56) are attributed to Safeer in the first half of the story which illustrates his involvement in more 'actions' before the war began. Before war, he follows his internalizations that her perceived from his society and Pakistan Military. In the beginning of identity exploration, it is almost impossible to come out of a cocoon that popularized version creates around us. Though the clashes soon appear before us; we take a lot of time like Safeer to accept and challenge those differences and clashes. Comparably, Safeer was following the felicity conditions to act according to orders. He takes time to accept change. However, when the war started, there is a shift and we find him involved in more mental processes (68) and his involvement in material processes (29) decreases significantly.

	Table 2			
All the transitivity	All the transitivity processes related to Safeer, 'the protagonist'			
	Part 1	Part 2		
Processes	Frequency	Frequency		
Material	56	29		
Mental	41	68		
Relational	16	9		
Behavioral	8	9		
Verbal	27	12		
Total	148 (37%)	127 (53%)		

Furthermore, the close textual analysis reveals that 'Safeer' is not a nuclear i.e. sole participant in all these processes. It means that he is not participating in communication process alone. He is rather involved with Tajassur or with Military officers owing to different situational roles as thinker, sayer or behaver. Therefore, these processes are analyzed further to find out the processes where 'Safeer' is a dominant character as he is no more following the instruction, directions, orders of others. In other words, he develops a freewill and says and acts according to his own perceptions.

Table 3 presents the different processes in the first and second part of the short story "Bingo' where Safeer is the nuclear participant in transitivity processes and performs the roles of *actor, sensor and sayer, behaver, speaker*. Table 3 illustrates that in the first part, Safeer is the nuclear participant in 76 processes out of 396 which is 19% of the entire processes. The involvement of Safeer in 19% of the entire processes means that he was single active interlocutor in part 1 in 76 processes. Significantly, in the second part of the story, he is the dominant participant in 39% of the processes which highlights a shift in his identity from being passive to be the active participant of different processes. His discussion with Tajassur and Pakistan Militay officers displays his personal understanding of the reality. He expresses power in his processes that present him as a dominant and transformed person in the second part.

Transitivity Analysis: A Study of Protagonist's Identity Shift in Short Story 'Bingo' Written in the Perspective of Dhaka Fall 1971

Transitivity processes involving the protagonist as the nuclear participant				
	Part 1		Part 2	
Process	Frequency	Percentage	Frequency	Percentage
Material	16	21%	11	11%
Mental	25	33%	56	60%
Relational	16	21%	9	9.6%
Behavioral	4	5.3%	6	6.5%
Verbal	15	19.7%	11	11.8%
Total	76/396	19%	93/240	39%

Table 3Transitivity processes involving the protagonist as the nuclear participant

Safeer's involvement in more material processes (21%) in first part as compared to the second part (11%) suggests that Safeer did what he was told to do in the military academy. However, during the 1971 war, he experiences a crisis as Bengali forces arrest him, and he lost all hopes of life. This caused a change in his approach towards life and he rethinks and reconsiders his assigned roles and duties. The detailed analysis of the processes reveals that, in the material processes of the first part, 'Safeer' acts 10 times as a single participant ("*I*") e.g. 'I managed', 'I turned', 'I shook', 'I made, 'I met', 'I sat', 'I went', 'I reached' etc. and 12 times he acts as a co-participant ("We") e.g. 'we passed', 'we struck', 'we fell', 'we made', 'we reached', 'we got', 'we clapped' etc. However, besides being the actor of 21% material processes, his actions do not affect anyone and show how he fulfills the duties and actions which are expected from him. Moreover, he is involved in the passive form as in 'made us', 'brought us', 'take us', 'served us' 'I was given', 'I was made', 'presenting me', 'he made me' etc.

On the other hand, in the second part of the short story, 'Safeer' acts as the sole participant of almost all the material processes, and just twice he acts as a co-participant of these processes that is when he was recalling the life at the military academy. Moreover, during the war, he is not the passive recipient of the material processes. In the second part, there are material processes like 'I drank', 'I kissed', 'I went', 'and I turned', 'I sat' etc. This reveals a shift in the protagonist's identity as he has control over his actions and is not being dictated by others.

In part 1 of the short story, there are more attributive and possessive relational processes as compared to part two where there are more circumstantial relational processes. There is also a considerable decline in the occurrence of relational processes in part 2. In part 1, the relational processes are like, 'I was senior', 'I was good in drill', 'I was getting angry', 'It was my choice', 'We were among such lucky ones', 'I was senior by number'. 'I was in the room', '(C.O) was proud of me'; 'I was in-charge of platoon'. But in part two the relational processes are like: 'I was in a little darkroom', 'I had to be tactful', 'My throat was parched', 'it was agony to be alive'.

Furthermore, the comparison of mental processes involving Safeer as the nuclear participant in both parts reveal that he is the participant of 33% of the mental processes in the first part and 60% of the mental processes in the second part of the story. Table 3 points out that there was a decrease in the occurrence of all the transitivity processes in part 2. However, there is a very significant increase in Safeer's involvement in mental processes from 33% to 60%. The comparison of 'Safeer's' mental processes before and after the 1971 events show a clear shift in his identity as he is more reflective and thoughtful, has his own opinions and views about what is happening around him and is not just following the dictations of others.

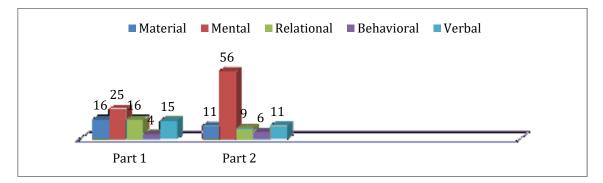


Figure 1. Comparison of Protagonist's transitivity processes before and after 1971 incidents

Figure 1 presents the comparison of Safeer's transitivity processes before and after the socio-political change during the Dhaka Fall (1971) and his personal experiences during the war. This figure demonstrates a symbolic increase in the protagonist's mental processes and decrease in all other processes in part 2 i.e. after the incidents of 1971 war. This shift in Safeer's personality can be explained through Marcia's identity statuses (1996). In part one of the story, Safeer performs his actions and role as other desired from him. This status is referred as identity foreclosure by Marcia (1996) during which a person seems willing to act upon some relevant roles and values and conforms to the expectations of others regarding his future. This identity status is highlighted by the protagonists' actions and thought processes before events of Dhaka Fall and his personal experiences as it is quite apparent in the following examples from the text:

- 1. "Yes sir", I shouted, as he liked us to do',
- 2. 'The C.O. order us and we go'.

In both these examples, we can see that Safeer acts as others ask or like him to do and he does not question them about these actions as he does not have his own opinion. During the incident of 1971, 'Safeer' passes through a crisis as he is arrested and is about to be killed by the 'Bingos' (Bangla Liberation Army). During this crisis, 'Safeer' is the nuclear participant of more mental processes rather than the verbal and relational processes. He appears to be more reflective as he rethinks his roles and actions and starts questioning himself in the form of interior monologue as it is evident from the examples:

- 1. 'What was the use of it all?'
- 2. 'I didn't know anything'.

This identity status is called moratorium by Marcia (1996) when a person is in crisis and he rethinks and reconsiders his roles and is ready to explore the new choices. Finally, when Tjassur, his mother and sister are killed in front of 'protagonist' by the Pakistani soldiers, he does not relate himself with the Pakistan soldiers and it seems that he is no more the part of them and he has chosen new roles in the new socio-political context as it is apparent from the following examples from the story:

- 1. 'I saw Pakistani commandos enter the house'
- 2. "What are they doing sir, your soldiers," I cried shaking the Captain.'

In the second example, 'Safeer' also questions the actions of the Captain, though he had also done the same before the 'crisis'. He has reconsidered his previous roles and has a different identity now. These processes reveal the protagonist's commitment to a sense of

identity to new roles that he has chosen. Marcia (1996) calls it as identity achievement. These statuses show how the protagonist's identity has undergone a shift after his experiences of the 1971 war.

These findings reveal that the incidents of 1971 war and Safeer's arrest brought a crisis in his life triggering the shift in his identity and his perception of self. He starts to rethink his role and his status in the society and begins to question others rather than just following the expectations of others. These findings suggest that the events of the war changed his outlook towards life and attitude towards people around him also changed. He is no more passive rather he is thinking deeply about life and is involved more in mental processes and less in material processes.

#### Conclusion

The analysis illustrates the use of transitivity system to interpret and understand a literary work and to elaborate and interpret the linguistic choices in the narratives. It further explains the ideational relations within the text help to construe the identity of characters by identifying different processes and the role of the nuclear as well as dominant participant within it. It is evident from the discussion that the protagonist of the short story 'Bingo' undergoes an identity shift during the story because of his personal experiences in the changing socio-political setup of the time, as he is involved in more mental processes in the second part of the story and less in material and relational processes as compared to first part. The transitivity model of analysis is a remarkable lens for elaboration of actions, participants and identities of the characters. It helps discern the minutes and trivialities that help focus to achieve the objective of research. Same is observed in this research that clarity of different types of actions and processes gained through this model has enabled this research to achieve meaningfulness and authenticity.

#### References

- Abdullah, F. S. (2004). Prolegomena to a Discursive Model of Malaysian National Identity in *Systemic Functional Linguistic and Critical Discourse Analysis* ed. By Young, L. and Harrison, C. New York: Continuum.
- Ahmad, Saeed. (2019) Transitivity Analysis of the short story *"The Happy Prince" written by Oscar Wilde.* Volume 5, Issue 2, Article. http://doi.org/10.24113/ijohmn.v5i2.90
- Cunanan, B.T. (2011). Using Transitivity as a Framework in a Stylistic Analysis of Virginia Woolf 's Old Mrs. Grey. *Asian EFL Journal. Professional Teaching Articles*. Vol. 54.
- Fairclough, N. (2001). Critical Discourse Analysis as a Method in Social Scientific Research.In Wodak, R., & Meyer, M. (Eds), *Methods of Critical Discourse Analysis* (pp. 121-138).London: Sage Publications.
- Fairclough, N. (2003). *Analyzing Discourse: Textual analysis for social research*. London: Routledge.
- Halliday, M.A.K. (1981). Explorations in The Function of Language. London: Edward Arnold.
- Halliday, M. A. K. (1986). *An Introduction to Functional Grammar*. London: Edward Arnold Publishers.
- Halliday, M. A. K. (1994). *An Introduction to Functional Grammar* (Second Edition). London: Edward Arnold.
- Halliday, M. A. K. (1997). Working with Grammar. London: Edward Arnold.
- Halliday, M.A.K. & Mathiessen, C.M.I.M. (2004). *An Introduction to Functional Grammar*. London: Arnold.
- Kavalir, M. (2016). Paralysed: A Systemic Functional Analysis of James Joyce's Eveline. *ELOPE: English Language Overseas Perspectives and Enquiries.* Vol. 13 (2), 165-180(246).
- Marcia, J. E. (1966). Development and validation of ego-identity status. *Journal of personality and social psychology*, *3*(5), 551.
- Mehmood, A., Amber, R., Ameer S. & Faiz R. (2014). European Journal of Research in Social Sciences, Transitivity Analysis: Representation of Love In Wilde's *The Nightingale and The Rose*, 2, 4, 78-85.
- Nguyen, T. (2012). Transitivity analysis of heroic mother by Hoa Pham. *International Journal of English Linguistics.* 2, 4, 85–100.
- Wulandari, N. (2016). Transitivity System in Two Versions of Cindrella Stories: A Systemic Functional Perspective, English Language Teaching Department Tarbiyah and Teacher Training Faculty. Syekh Nurjati State, Islamic Institute, Cirebon. Undergraduate Thesis (14121320252)
- Ochs, E. (2005). Constructing Social Identity: A Language Socialization Perspective. *Intercultural Discourse and Communication: The Essential Readings*, 78-91.
- Polovina-Vukovic, D. (2004). The Representation of Social Actors in the Globe and Mail during the Break-up of the Former Yugoslavia in *Systemic Functional Linguistic and Critical Discourse Analysis* ed. by Young, L. and Harrison, C. New York: Continuum.

Qasim, H.M. Talat, M. & Khushi, Q. (2018). *An analysis of Transitivity Options in Hamid's The Reluctant Fundamentalist.* NUML Journal of Critical Inquiry Vol 16 (ii) December, 2018.

ISSN 2222-5706

Rizwan, S. (2013). Representation of Sociocultural Identity in Urdu Short Story: A Transitivity Analysis. *Academic Research International*, 4(2), 375

Simpson, P. (2004). *Stylistics*. New York: Routledge.

Song, Z. (2013). Theory and Practice in Language Studies, *Transitivity Analysis of A Rose for Emily*, 3, 12, 2291-2295.