3.0 Chomsky's work on grammaticality, led to developments in the theory of grammaticality, by generating an interest in the area. These developments were based on Chomsky's 1957 model as far as the basic formulation of the concept of grammaticality was concerned. However, there were many differences as shall be seen below.

The theories concerning the problem of grammaticality, which are discussed here were much more biased toward semantics at this point, than corresponding developments in Transformational Generative Theory.

The contributions of Katz *Semi Sentences* (1964), Ziff *On Understanding "Understanding Utterances"* (1964), and Putnam *Some Issues in the Theory of Grammar* (1961) are taken as representative of this. Though the contributions of Katz and Ziff will be described separately in detail, certain common points of interest do emerge. It is important to note that both Katz's and Ziff's theories were semantically oriented, though they were heavily reliant on the Chomskyan concept of grammar. There also seems a greater concern with the comprehension of deviant and semantically utterances, than merely
with how they could be accounted for. However, this can be seen as a development in accordance with Chomsky's statement that sentences that were "deviant but comprehensive" should be accounted for. Another aspect shared by these two theories is that they are based on the idea of accounting for deviance, by operating from a non-deviant set of utterances as a base.

3.1 Ziff's concern (in his Understanding "Understanding Utterances") is to understand how utterances are understood - when the hearer hears them for the first time and out of any given context. According to Ziff what is involved in understanding is "apprehending" the morphemic constitution and syntactic structure of any utterance. This is illustrated by the fact that speakers understand a sentence like "Hippopotami are graceful". It can then be argued that deviant sentences are also understood because of the structure they retain.

"... that means that the distinction between the non-deviant and the deviant cannot be a distinction between

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1 This is in accordance with Chomsky's theory that deviant sentences are understood by imposing an interpretation by analogy with grammatical utterances.
utterances having and utterances lacking structure: It can only be a distinction between types of structure. (Ziff, P. 1964 : 393).

According to Ziff, deviant utterances are those which are traditionally considered ungrammatical, as well as those which exemplify the problem of co-occurrence. For example, the sentence "He stepped on a green thought" is deviant because of the co-occurrence of 'green' and 'thought' in the given linguistic environment.

The chief thrust of Ziff's argument about the comprehension of deviant sentences is that "a deviant utterance has that structure that constitutes the terminus of the simplest route from the regular grammar to the utterance in question". (Ziff, P. 1964 : 393). To understand this, one has to first understand what is involved in understanding the structure of non-deviant, fully grammatical sentences. "If one is concerned with semantic analysis it is useful to consider, and, as it were, to operate with a proper subset of the set of what are traditionally classed grammatical utterances viz. the set of syntactically non-deviant utterances". (Ziff, P. 1964 : 392).
Thus, the concept of "simplest route from the regular grammar" would entail that one grasps the simplest relation between the deviant and the non-deviant utterances.

The structure of the set of non-deviant utterances as described by Ziff follows the 1957 Chomsky model of kernels and transforms.

The deviant utterances that Ziff choses to deal with as examples, are:

1. He expressed a green thought.
2. Over there is a green thought.
3. The man the women kiss.
4. The men grief, the women.
5. I saw man kiss woman.
6. House the is red.

Ziff feels that we understand all these sentences intuitively, in different ways, and that these intuitions can be explained in terms of the shortest route from the regular grammar.

1. 'He expressed a green thought'.

According to Ziff, this sentence is deviant because of the co-occurrence of 'green' and 'thought'. The deviance is caused by the word 'green', as many
words replacing 'green' in this context would yield a non-deviant sentence, while if 'green' is retained, no grammatical sentence is possible. Hence, Ziff formulates the rule "Let $E_i$ be the class of elements that can occur without syntactic deviation in the environment. "He expressed a — thought: then we can relate the utterance to the regular grammar by invoking the rule $E_i \rightarrow \text{green}". (Ziff, P. 1964 : 393).

2. 'Over there is a green thought'
The deviation is clearly caused by 'thought'; so let $E_j$ (where $i \neq j$) be the class of elements that can occur in the environment "over there is a green —", and this can be related to the regular grammar by the rule $E_j \rightarrow \text{thought}$.

3. 'The men the women kiss' is ambiguous.
We can interpret it as 'The men kiss the women' or 'The women kiss the men'.

This sentence is deviant according to Ziff, as it has the form $NP_i - NP_j - V$ which cannot be generated by a regular grammar. We thus relate it to the regular grammar by the rule "$NP_i - V - NP_j \rightarrow NP_iNP_jV" or, "$NP_i - V - NP_j \rightarrow NP_j - NP_i - V". (Ziff, P. 1963 : 396).
4. 'The men grief the women'
The rule formulated to deal with this is $E_k \rightarrow$ grief when $E_k$ is the class of elements that can enter the transformation "The men caused the women $E_k \rightarrow$ the men $E_k$ the women". (Ziff, P. 1964 : 396).

5. 'I saw man kiss woman'
As this is deviant because of the deletion of articles Ziff postulates the rule "Ar $\rightarrow$ $\emptyset$" where "Ar is the class of articles".

6. 'House the is red'
Here the deviation is caused by misordering the sequence, and can be thus accounted for, by the rule "NT $\rightarrow$ TN". (T - The, N - Noun).

Having accounted for a range of deviance, Ziff feels that deviations are of two types. "Certain utterances deviate in regular ways, others in irregular ways". (Ziff, P. 1964 : 396). He therefore suggests that all utterances should be divided into four "relatively distinct syntactic classes .... the class of kernels, the class of transforms, the class of variants and the class of inversions". (Ziff, P. 1963 : 396).

Variants are defined by Ziff as deviant utterances along regular lines - "variations on standard
themes". They consist of inversions - (eg. The ball hit the boy), deletions, (such as deletions of articles) or additions (for example I the went the to the see the film the).

Inventions are irregular deviations according to Ziff. The simplest rules concerning inventions are those which involve the extension or contraction of word classes.

The "men grief the women" is according to Ziff representative of word class extension.

On the basis of this, Ziff suggests that there are five "basic type" of routes from a regular grammar to a syntactically deviant utterance, which can be represented by rules.

1. ".... A .... B → .... B .... A" - the rule of inversion.
2. ".... A .... B → A" - the rule of deletion.
3. ".... A .... → .... A .... B ...." - the rule of addition.
4. "A → a" word class extension.
5. (A → a) | B → b word class contraction
   (Ziff, P. 1964 : 398)

1 The capital letters stand for word-classes and the lower case letters for words.
Ziff's model is significant to the extent that it operates within the Transformational Generative framework, but it seems unsatisfactory on a number of counts. A more consistent theory regarding the understanding of deviance, and how it can be accounted for is needed. Ziff's selection of the types of deviance that he chooses to deal with seem arbitrary. They are also not well defined.

The rules dealing with the class of elements seems to leave too many gaps. For example, in the sentences given by Ziff to illustrate his rules - "He stepped on a green thought" and "He expressed a green thought", Ziff states that the deviance is due to the co-occurrence of green and thought and suggests non-deviant frames where one can appear without the other. At no point is it mentioned that "stepped" cannot co-occur with "thought" in the first sentence, and "expressed" with "green" (except may be metaphorically). Thus one facet of deviation is not even recognised.¹

It is easy to see that using Ziff's rules it is possible to generate sentences with extremely varying degrees of deviance. Ziff's model also does not seem

¹ Chomsky's hierarchy of categories seems much more successful in this regard.
to provide any insight into the extent of degree of deviation. The division of types of deviance into those considered traditionally ungrammatical and syntactically deviant is also not explicit enough.

However, as Katz\(^1\) has pointed out - "The uniqueness of Ziff's proposal lies in his suggestion regarding how we should construe the notion "simplest relation to the set of sentences"." According to Katz's requirement of a theory of semi-sentences, Ziff's rules are rejected as not being able to separate nonsense strings from semi-grammatical ones.

The simplicity of Ziff's model, instead of being able to explicate the simplest relation between the set of deviant and non-deviant sentences, is responsible for a lack of clarity and sharpness and under-mines the theoretical content of his views.

3.2 Putnam's suggestions *Some Issues in the Theory of Grammar* (1961) are based, according to him, on

\(^1\) Katz, J. 1964 : 407.
Ziff's concept of deviance. What Putnam seems to stress on is the ability of the speakers to recognise deviation. He feels that the distinction between deviant and non-deviant utterances is close to that of the traditional distinction between literal and figurative sentences - inasmuch both deviant and figurative sentences need to have an interpretation imposed on them.

According to Putnam, when a sentence is recognised as non-deviant, it implies that the recognition of deviance is as intuitive. Putnam reiterates that the term "deviant" is obviously a technical one, and has an "explanatory, not valuational function". Classifying a sentence as deviant is the first step towards analysis and one can proceed with "how it deviates from what and why". To illustrate this, Putnam considers Dylan Thomas' sentence "A grief ago", as an example. The significant issues, according to Putnam are to understand how the sentence is considered deviant and how it is understood. According to him, the one word 'grief' is what makes the sentence deviant. Any word we substitute for it to make the sentence non-deviant will be an expression or measure of time - like a year.
week, hour, etc. However if we accept the sentence, it does not mean that we accept the word 'grief' as a measure of time. 'Grief' retains its usual dictionary meaning and all its other uses.

Putnam feels that a degree of idealisation is inevitable in linguistic work. Since speakers can recognise deviance out of context, it is possible to define deviation without recourse to extralinguistic concepts. Putnam suggests that deviance could be dealt with by the model of a classifier. The model would be along the lines of the Turing Machine, and would reject or accept sentences according to a mechanical program. The "self-containedness" of language according to Putnam gives credibility to the suggestion that the model of a classifier can be considered.

3.3 Katz's theory of semi-sentences is among the clearest and most well defined works in this area. This is probably also due to the fact that it is a conscious effort addressed squarely to the problem and not culled out of a more generalised treatment.
According to Katz "A theory of semi-sentences, a theory that characterises the set of ungrammatical strings that the speakers' knowledge of linguistic structure enables him to understand and explains why the members of this set are comprehensible, is, therefore to be regarded as an integral part of the description of the language, not as a bonus it is nice but not necessary to have". (Katz, J. 1964 : 400).

Katz underlines the fact that the ability to recognise deviance is a part of the speakers' ability to understand and recognise grammatical sentences of the language.

Operating within the Transformational Generative framework, Katz develops the theory of semi-sentences, which is probably one of the most important links between the 1957 and 1965 models.

A generative grammar that generates an infinite set of strings as well as provides their structural descriptions, reflects the speakers' ability to understand this infinite set of well-formed sentences. However, speakers of a language can also understand a great many sentences that are not well-formed. This means that the speakers are able to grasp the structure
such as it is" of ill-formed or partly structured strings. Thus, if a grammar is to represent the speakers' knowledge, it must also be able to account for semi-sentences.

"A grammar tells us what is and what is not grammatical, but it does not say what combinations of what is and what is not grammatical are comprehensible to the speakers of the language.

"Thus, we need a theory of semi-sentences: a theory whose basic aim is to describe the ways grammatical parts and ungrammatical parts can combine to produce sentence-like strings which speakers understand, even though they are not strictly, or even "not so strictly" well-formed". (Katz, J. 1964 : 402).

Katz considers it necessary to separate semi-sentences from nonsense strings. He thus places certain requirements on deviant strings. To qualify as a semi-sentence, a string must be comprehensible and retain "sufficient structure". By these requirements Katz limits the extent of deviance that a theory of semi-sentence needs to account for.
To this end, he formulates two requirements "R1: A Theory of semi-sentences partitions the set of ungrammatical strings into two exclusive and jointly exhaustive proper subsets: The Set SS of semi-sentences and the set NS of nonsense strings". (Katz, J. 1964: 402).

"R2: A Theory of semi-sentences explicates the speakers' knowledge of the patterns of deviation from grammaticality that preserve intelligibility". (Katz, J. 1964: 403).

According to Katz, a speaker understands semi-sentences by association with fully grammatical sentences. Thus a set of rules transfers the meaning from the non-deviant set of sentences to the deviant semi-sentences with which they are associated.

The chief components of Katz' theory consist of the 'comprehension set' and 'transfer rules'. The 'comprehension set' contains fully grammatical non-deviant sentences. These form the basis on which the deviant sentences are understood. Transfer Rules are a body of rules which connect the non-deviant sentences from the 'comprehension set' to the deviant sentences.

It is, however, possible and likely that the comprehension set will contain strings that are mere paraphrases of each other. Thus, a purely syntactic solution
is not enough, and a theory of semi-sentences requires a semantic component, which can decide when sentences are paraphrases of each other.

Katz suggests that to demarcate the set of SS from NS as required by R1, rules are built in a way that "semi-sentences are always associated with a comprehension set containing a finite number of (paraphrases independent) sentences, whereas nonsense strings are always associated with a comprehension set containing no numbers or a comprehension set containing an infinite number of sentences". (Katz, J. 1964 : 411).

The form of a transfer rule suggested by Katz is to be regarded as one given alternative among several others that are theoretically possible. A system of transfer rules contains one rule for each grammatical rule. A transfer rule can however be connected to more than one grammatical rule. "Each transfer rule tells how the rule(s) of the grammar to which it corresponds can be violated without leading to derivations whose terminal lines are in NS". A theory of semi-sentences thus generates semi-sentences .... when the transfer rules are used to construct their semi-derivations. The comprehension set of a semi-sentence is constructed from a semi-derivation in a mechanical
The phrase-structure of semi-derivations begins with the symbol $S_5$ instead of $S$. It consists of a finite number of lines each of which is derivable from the preceding one by applying a transfer rule connected to a phrase-structure rule, or a phrase-structure of the regular grammar. A transformation semi derivation begins with phrase structure derivations and semi derivations. It consists of a finite number of lines derivable from the preceding one by the application of a transfer rule corresponding to a transformation of the grammar. Thus, every semi-derivation has a transfer rule of grammar applied to it. This indicates its grammatical structure as well as the manner of its deviation.

For example, a phrase-structure rules develops $N$ to $N_{\text{anim}}$ when it is the object of verbs like "frighten", "astonish", "surprise", etc. A transfer rule relaxes the rule to $N_{\text{inan}}$, when then yields sentences like "bread frightens sincerity", etc. In some cases it might be necessary to develop the "phrase-structure transfer rule that develops a marker into one less than the markers it usually goes into. ...what we need is some way of

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1 A transformational semi derivation is the transformational derivation of a semi-sentence.
distinguishing between those phrase-structure rules which develop word classes, and those which develop word classes or word sub-classes that cross-classify words". (Katz, J. 1964 : 413).

A transfer rule that corresponds to a Transformation operates on the basis of a formally stated structural analysis. Such a transfer rule also is a formally stated 'structural change' which applies in case the string in question satisfies the Structural Analysis. A Transfer Rule should ideally operate on a large number of Transformations or phrase structure rules. Each Transfer Rule should state that a "certain class of rules can be permissibly violated in such-and-such a way under so-and-so conditions". (Katz, J. 1964 : 414).

Katz, however, does not provide a successfully formulated Transfer Rule which would clearly demonstrate its application. Katz's description of a Transfer Rule can be considered more on the lines of a suggestion.

Transfer Rules by themselves cannot prevent the generation of Nonsense Strings. Katz thus proposes "traffic rules" which will restrict the number and kind of violations in a semi-derivation, taking into account the kind of violations already existing. Katz gives an
example of what is a "putative traffic rule" might be like - "No transfer rule $R^1$ corresponding to the rule of grammar $R$ can take the last line of an unterminated derivation $L_n$, into the line $L_n + 1$, if $L_n$ is of the form $XEY$ partly because $E$ satisfies the marker $M$ in the structural analysis of $R^1$, and it is the case both that $E$ resulted from a previous application of a transfer rule (and could not have been obtained by applying a rule of the grammar) and that the structural analysis of $R$ and $R^1$ differ with respect of $M$". (Katz, J. 1964 : 414).

Katz is of the opinion that a theory of semi-sentences needs a semantic component. This is not only to prevent paraphrases in the comprehension set as has been said earlier, but because it is not only grasping the syntactic structure that is entailed in understanding a semi-sentence. It is more important that the meaning be grasped by understanding the semantic relations. Thus transfer rules and traffic rules can be set up with regard to the semantic component, to explicate the semantic structure of a sentence, and prevent semantic violations that would result in the production of Nonsense Strings. Like all the solutions considered so far, Katz' proposal is also tentative. What is important is the move towards semantics which resulted in the addition of the
semantic component to the 1965 aspects model. As we have seen Chomsky's contribution to the understanding of grammaticality is considerable. At this stage, the importance of his contribution lies may be not so much in the tentative and schematic solutions he has offered, as in the questions he raises about the nature and importance of explicating the concept "grammaticality". It is important to note the influence it had on future work on grammaticality whether it was rejected or accepted even in part.

A pointed criticism that Katz (1964) makes of Chomsky's theory is that it fails to separate Nonsense Strings from semi-grammatical ones. However, this criticism also holds true of the later developments in Chomsky's theory.

Katz also gives counter examples to prove that the N-level hierarchy of categories is not successful in being able to separate semi-grammatical sentences from Nonsense Strings. Because of the failure to separate the Nonsense Strings from the semi-grammatical sentences, both can be represented on the same level. This would mean that there are "pairs in which the string ranked more grammatical is not comprehensible and the string ranked less grammatical is comprehensible". (Katz, J. 1964 : 403).
There are strings which would be ranked 2-grammatical. For example, "The sincerity that the idea frightens you astonishes me" or "The beef cut sincerity". These strings have the proper word-category relations, but not the proper word-sub-category relations and are thus 2-grammatical, though quite incomprehensible. At the same time we have 3-grammatical strings such as "If there is any truth in what he says, it would be to insist foolish" and "She is pretty, charming, plays tennis with the finest people, sweet and happy". These, according to Katz are more comprehensible than the 2-grammatical strings just mentioned, which indicates that Chomsky's "type of theory is inadequate".

3.4 The theoretical developments reviewed in this Chapter are significant for a number of reasons.

The attempts at describing deviance and evolving a methodology to account for degrees of grammaticality form a link between Chomsky's earlier approach and the Aspects model. The importance of semantics in a theory of grammaticality is introduced at this stage, notably

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These contributions, it should be noted, are essentially made from a background of philosophy. As has been discussed in Chapter One, Philosophers had been concerned with problems of language and meaning. However, it was felt that philosophers had not been able to develop an "adequate theory of language". The approach to language and linguistic problems that is represented here, was a part of a new approach. An attempt was made to solve problems in the philosophy of language by using theoretical models and methodology from linguistics.

According to Katz and Fodor (1964) philosophers had to rely on their own linguistic notions, in the absence of a sufficiently developed theory of language. It was felt that generative grammar could offer significant insights into the nature of language and provide a framework within which problems arising from the philosophy of language could be dealt with.

"Lacking a theory of meaning which would serve to theoretically characterize basic semantic concepts, to settle whether two uses of an expression are same or different, to delineate deviations from the regularities
in the language, and to provide some means for evaluating proposed solutions to philosophical problems arising in connection with the employment of language, the ordinary language philosopher is increasingly forced to resort to his own linguistic intuitions". (Fodor, J.A. and J. Katz, 1964 : 15).

The Generative Grammar model which is based on reflecting a speakers' linguistic ability and intuition attracted philosophers working on problems of language.

It was felt that, when confronted by linguistic oddity, the ordinary-language philosopher had to rely on his own intuition. This would result in each odd sentence being treated in isolation. It should be noted here, however, that sentences which are considered odd by linguists and speakers of a language, are not necessarily philosophically odd. There are differences of opinion even among philosophers who are concerned with deviance and oddity.

These differences of opinions and a consciousness of inadequacy where theories of meaning are concerned, prompted philosophers to examine linguistic analysis.
The development of Chomsky's degrees of grammaticalness approach drew the attention of some philosophers of language: "the extension to semi-sentences promises important consequences for philosophy. The most direct consequence is for the construction of a criterion of cognitive significance". (Fodor, J.A. and Katz, J. : 354).

Marhenke is quoted by Fodor and Katz in this connection, as being the first philosopher to realise that a string of words need not constitute a sentence, as it may be grammatical, ungrammatical or neither. According to Marhenke a deviant sentence is acceptable if it is possible for a "grammarian to restore it to correctness". ¹

It may be said, for the first time philosophers entered the realm of linguistic analysis, as developed by linguists, in order to investigate the nature of language and meaning.

At the same time, what is interesting is the fact that the contributions made by some of these philosophers are significant for the theory of language

¹ This invokes Lyon's criterion of "corrigibility" as being indication of "grammatical unacceptability". By this criterion, a speaker cannot only recognise a deviant sentence, but correct it. (Lyons, J. 1977 : 379)
within linguistics, and often, it is not necessary to refer back to the philosophical considerations which persuaded these philosophers to examine linguistic models particularly the Transformational Generative models.

Against this background, we can point out the importance of the contributions made by Katz, Ziff and Putnam, to the theory of grammaticality as conceived in Transformational Generative grammar.

Though Chomsky suggests that deviant sentences are understood by analogy with grammatical strings, the methodology he proposes does not reflect this. The suggestions made by Ziff, Putnam and Katz, all however are based on the attempt to connect deviant strings to grammatical ones.

The comprehension of deviance is emphasised in these works, especially as compared to Chomsky. The attempt does not seem to be one of merely formulating a methodology, within the Transformational Generative framework, that would reflect degree of grammaticalness. The methodology proposed by Katz and Ziff also attempt to show how deviant sentences are understood.
by speakers of a language. The emphasis on comprehension highlights the urgency of incorporating semantics into the fully defined notion of grammaticality.

Katz, as we have seen, makes a strong case for the inclusion of a semantic component in a theory of semi-sentences. He categorically states that understanding a semi-sentences requires that the semantic structure is grasped by the hearer. The failure of Chomsky's attempt to account for degrees of grammaticality without recourse to meaning, was one of the factors that led to the incorporation of a semantic component in the Aspects model.