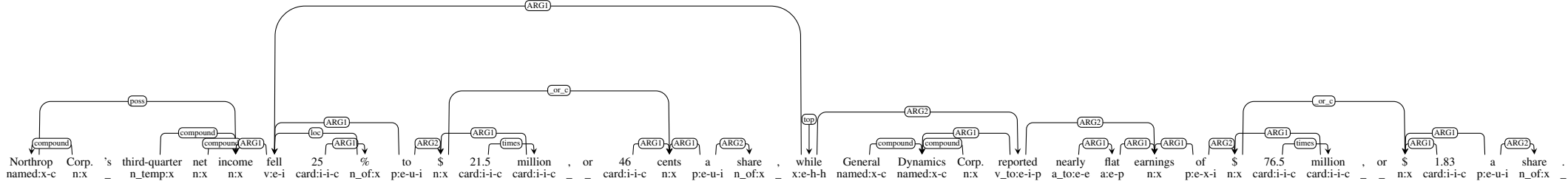
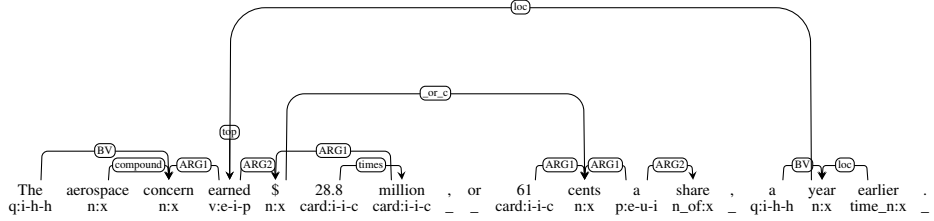


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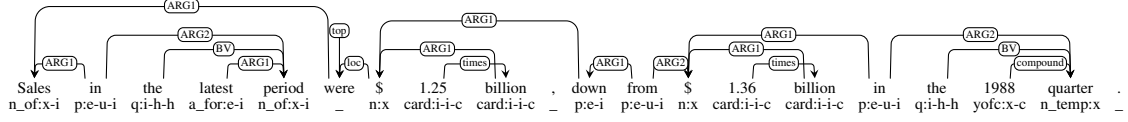
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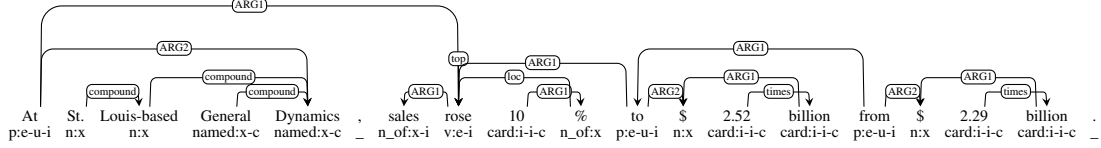
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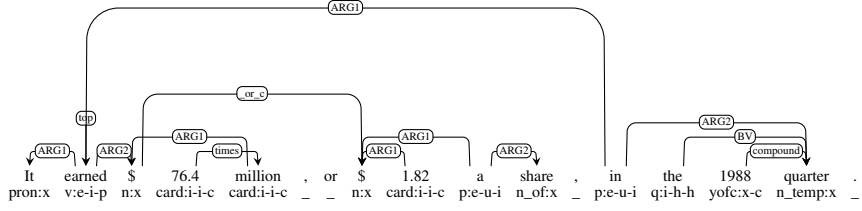
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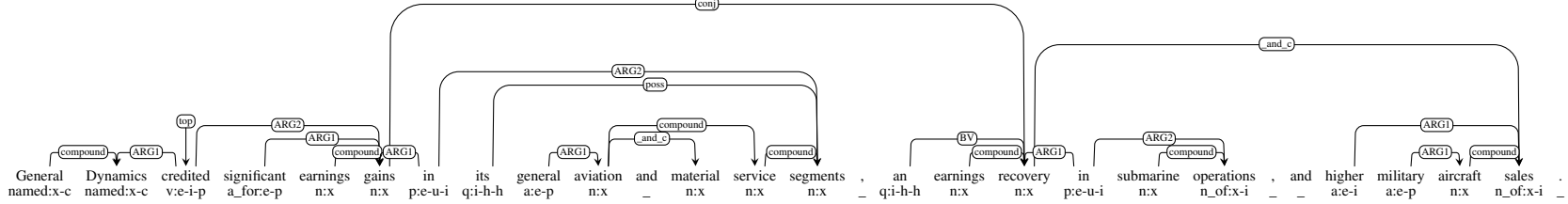
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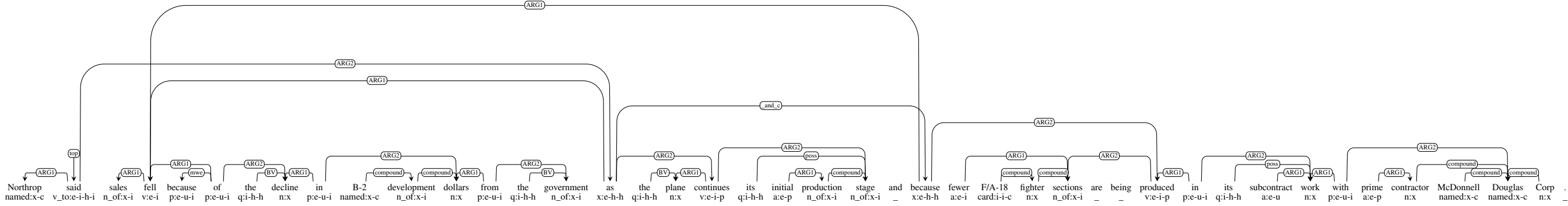
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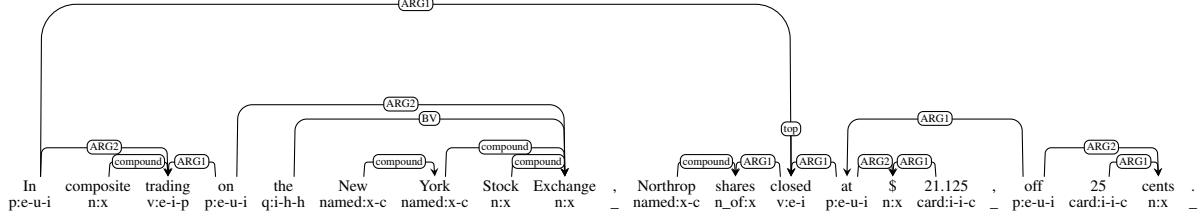
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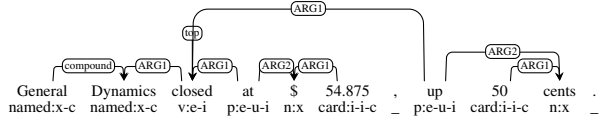
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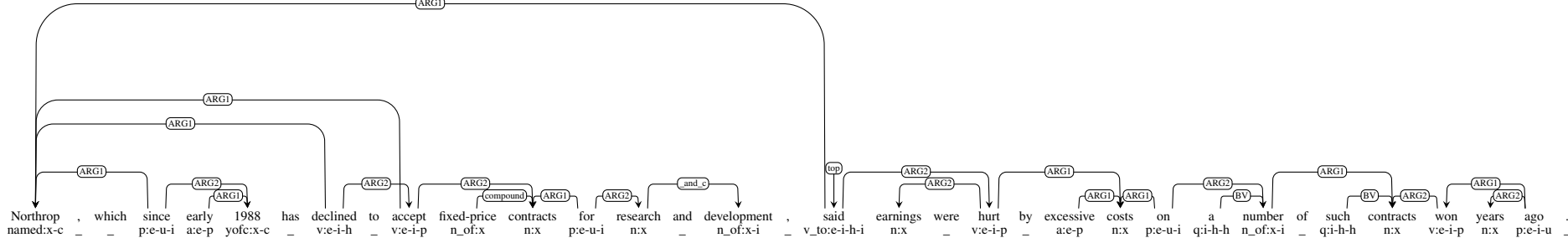
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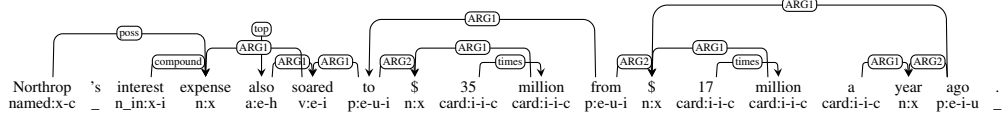
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[21827011]



[21827013]



[21827014]

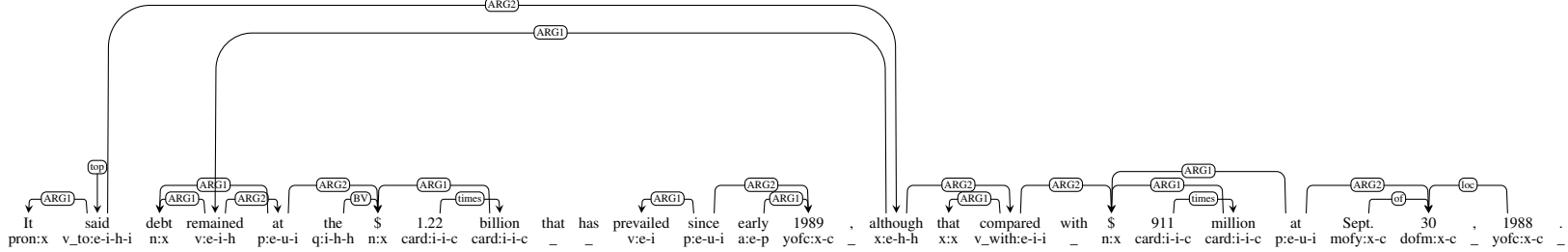


Figure 10: A parse tree for the sentence "The backlog of undelivered orders at Northrop on Sept. 30 was 4.68 billion card-i-e down from 5.16 billion card-i-e a year earlier". The tree is a hierarchical structure showing the syntactic analysis of the sentence. The root node is S, which branches into NP (The backlog of undelivered orders at Northrop on Sept. 30) and VP (was 4.68 billion card-i-e down from 5.16 billion card-i-e a year earlier). The NP branches into the determiner "The", the noun "backlog", the prepositional phrase "of undelivered orders", the prepositional phrase "at Northrop", the prepositional phrase "on Sept. 30", and the verb "was". The VP branches into the auxiliary verb "was", the adverb "4.68", the noun "billion", the prepositional phrase "card-i-e down", the prepositional phrase "from 5.16 billion card-i-e", the adverb "a", the noun "year", and the adjective "earlier". The tree is annotated with various grammatical features and is used to illustrate the parsing process.

[illegible][illegible]

Figure 10: A sentence with multiple arguments. The sentence is: "At p-e-u-i General Dynamics, factors reducing earnings p-e-u-i in the q-i-h-h military aircraft segment n\_p included higher a-e-i levels n\_x of p-e-x-i cost-sharing v-e-i-p in p-e-u-i development n\_o-of-x-i of the q-i-h-h Advanced named-x-c Tactical named-x-c Fighter named-x-c and q-i-h-h the high a-e-p cost of p-e-x-i an advanced version a-e-p n\_o-of-x-i of the q-i-h-h named-x-c F-16 fighter n\_x". The diagram shows the hierarchical structure of the sentence, with arguments (ARG1, ARG2, ARG3, ARG4, ARG5, ARG6, ARG7, ARG8, ARG9, ARG10, ARG11, ARG12, ARG13, ARG14, ARG15, ARG16, ARG17, ARG18, ARG19, ARG20, ARG21, ARG22, ARG23, ARG24, ARG25, ARG26, ARG27, ARG28, ARG29, ARG30, ARG31, ARG32, ARG33, ARG34, ARG35, ARG36, ARG37, ARG38, ARG39, ARG40, ARG41, ARG42, ARG43, ARG44, ARG45, ARG46, ARG47, ARG48, ARG49, ARG50, ARG51, ARG52, ARG53, ARG54, ARG55, ARG56, ARG57, ARG58, ARG59, ARG60, ARG61, ARG62, ARG63, ARG64, ARG65, ARG66, ARG67, ARG68, ARG69, ARG70, ARG71, ARG72, ARG73, ARG74, ARG75, ARG76, ARG77, ARG78, ARG79, ARG80, ARG81, ARG82, ARG83, ARG84, ARG85, ARG86, ARG87, ARG88, ARG89, ARG90, ARG91, ARG92, ARG93, ARG94, ARG95, ARG96, ARG97, ARG98, ARG99, ARG100) and their corresponding semantic roles (ARG1, ARG2, ARG3, ARG4, ARG5, ARG6, ARG7, ARG8, ARG9, ARG10, ARG11, ARG12, ARG13, ARG14, ARG15, ARG16, ARG17, ARG18, ARG19, ARG20, ARG21, ARG22, ARG23, ARG24, ARG25, ARG26, ARG27, ARG28, ARG29, ARG30, ARG31, ARG32, ARG33, ARG34, ARG35, ARG36, ARG37, ARG38, ARG39, ARG40, ARG41, ARG42, ARG43, ARG44, ARG45, ARG46, ARG47, ARG48, ARG49, ARG50, ARG51, ARG52, ARG53, ARG54, ARG55, ARG56, ARG57, ARG58, ARG59, ARG60, ARG61, ARG62, ARG63, ARG64, ARG65, ARG66, ARG67, ARG68, ARG69, ARG70, ARG71, ARG72, ARG73, ARG74, ARG75, ARG76, ARG77, ARG78, ARG79, ARG80, ARG81, ARG82, ARG83, ARG84, ARG85, ARG86, ARG87, ARG88, ARG89, ARG90, ARG91, ARG92, ARG93, ARG94, ARG95, ARG96, ARG97, ARG98, ARG99, ARG100) and their corresponding semantic roles (ARG1, ARG2, ARG3, ARG4, ARG5, ARG6, ARG7, ARG8, ARG9, ARG10, ARG11, ARG12, ARG13, ARG14, ARG15, ARG16, ARG17, ARG18, ARG19, ARG20, ARG21, ARG22, ARG23, ARG24, ARG25, ARG26, ARG27, ARG28, ARG29, ARG30, ARG31, ARG32, ARG33, ARG34, ARG35, ARG36, ARG37, ARG38, ARG39, ARG40, ARG41, ARG42, ARG43, ARG44, ARG45, ARG46, ARG47, ARG48, ARG49, ARG50, ARG51, ARG52, ARG53, ARG54, ARG55, ARG56, ARG57, ARG58, ARG59, ARG60, ARG61, ARG62, ARG63, ARG64, ARG65, ARG66, ARG67, ARG68, ARG69, ARG70, ARG71, ARG72, ARG73, ARG74, ARG75, ARG76, ARG77, ARG78, ARG79, ARG80, ARG81, ARG82, ARG83, ARG84, ARG85, ARG86, ARG87, ARG88, ARG89, ARG90, ARG91, ARG92, ARG93, ARG94, ARG95, ARG96, ARG97, ARG98, ARG99, ARG100).

[illegible]

Figure 1 displays two dependency parse trees for the sentence: "Backlog named-x-c at p.e-u-i General named-x-c Dynamics named-x-c rose v-e-i to p.e-u-i \$ n.x 16.5 card-i-i-c billion card-i-i-c from p.e-u-i n.x \$ 15.8 card-i-i-c billion card-i-i-c".

The left tree (for "Backlog named-x-c at p.e-u-i General named-x-c Dynamics named-x-c") has a root node **ARG1** branching into **ARG7** (Backlog named-x-c) and **ARG2** (General named-x-c Dynamics named-x-c). The **ARG2** node further branches into **compound** (General named-x-c) and **Dynamics** (Dynamics named-x-c).

The right tree (for "rose v-e-i to p.e-u-i \$ n.x 16.5 card-i-i-c billion card-i-i-c from p.e-u-i n.x \$ 15.8 card-i-i-c billion card-i-i-c") has a root node **ARG1** branching into **ARG2** (rose v-e-i to p.e-u-i \$ n.x) and **times** (16.5 card-i-i-c billion card-i-i-c). The **ARG2** node further branches into **ARG1** (from p.e-u-i n.x) and **times** (\$ 15.8 card-i-i-c billion card-i-i-c). The **times** node further branches into **ARG1** (from p.e-u-i n.x) and **times** (\$ 15.8 card-i-i-c billion card-i-i-c).

[illegible]