

## Appendix 1 - Sentences used in thesis & all results table

Every first and third sentence contain the presupposition ‘too’, and the other 2 don’t. **Target words** are marked red, **antecedents** are marked blue.

[[ "target-1-too-00", 1], {s: "The cook is a **dancer** and the waiter **dances** too, I have been told recently."},

[[ "target-1-nil-00", 1], {s: "The cook is a swimmer and the waiter dances often, I have been told recently."}

[[ "target-1-too-04", 1], {s: "The cook is a **dancer** and the waiter, who is a boxer, **dances** too, I have been told recently."},

[[ "target-1-nil-04", 1], {s: "The cook is a swimmer and the waiter, who is a boxer, dances often, I have been told recently."}

[[ "target-2-too-00", 2], {s: "The librarian is a **painter** and the history teacher **paints** too, according to my sister."},

[[ "target-2-nil-00", 2], {s: "The librarian is a reader and the history teacher paints frequently, according to my sister."},

[[ "target-2-too-04", 2], {s: "The librarian is a **painter** and the history teacher, who presides over an association, **paints** too, according to my sister."},

[[ "target-2-nil-04", 2], {s: "The librarian is a reader and the history teacher, who presides over an association, paints frequently, according to my sister."},

[[ "target-3-too-00", 3], {s: "The bakery has **shut down** and the cafe is **closed** too, so the streets are empty."},

[[ "target-3-nil-00", 3], {s: "The bakery is dull and the cafe is closed down, so the streets are empty."},

[[ "target-3-too-04", 3], {s: "The bakery has **shut down** and the cafe, which was built nearby, is **closed** too, but the streets are empty."},

[[ "target-3-nil-04", 3], {s: "The bakery is dull and the cafe, which was built nearby, is closed down, so the streets are empty."},

[[ "target-4-too-00", 4], {s: "The cat has **eaten** and the dog **had** his **food** too, so everything is fine."},

[[ "target-4-nil-00", 4], {s: "The cat has slept and the dog had his food earlier, so everything is fine."},

[[ "target-4-too-04", 4], {s: "The cat has **eaten** and the dog, which was nervous today, **had** his **food** too, so everything is fine."},

[[ "target-4-nil-04", 4], {s: "The cat has slept and the dog, which was nervous today, had his food earlier, so everything is fine."},

[[ "target-5-too-00", 5], {s: "Falcons are **predators** and eagles **hunt prey** too, as claimed by our teacher."},

[[ "target-5-nil-00", 5], {s: "Geese are herbivores and eagles hunt prey often, as claimed by our teacher."},

[[ "target-5-too-04", 5], {s: "Falcons are **predators** and eagles, which are majestic birds, **hunt prey** too, as claimed by our teacher."},

[[ "target-5-nil-04", 5], {s: "Geese are herbivores and eagles, which are majestic birds, hunt prey often, as claimed by our teacher."},

[[ "target-6-too-00", 6], {s: "The frog on the left **secreted poison** through its skin and the frog on the right is **poisonous** too, according to the guide."},  
[[ "target-6-nil-00", 6], {s: "The frog on the left is a common frog and the frog on the right is poisonous enough, according to the guide."},  
[[ "target-6-too-04", 6], {s: "The frog on the left **secreted poison** through its skin and the frog on the right, which looks rather harmless, is **poisonous** too, according to the guide."},  
[[ "target-6-nil-04", 6], {s: "The frog on the left is a common frog and the frog on the right, which looks rather harmless, is poisonous enough, according to the guide."},

[[ "target-7-too-00", 7], {s: "The leopard is a night **hunter** and the Canada lynx **hunts** at night too, as stated by Wikipedia."},  
[[ "target-7-nil-00", 7], {s: "The Moose feeds during the daytime and the Canada lynx hunts at night relentlessly, as stated by Wikipedia."},  
[[ "target-7-too-04", 7], {s: "The leopard is a night **hunter** and the Canada lynx, which is quite peaceful, **hunts** at night too, as stated by Wikipedia."},  
[[ "target-7-nil-04", 7], {s: "The Moose feeds in the daytime and the Canada lynx, which is quite peaceful, hunts at night relentlessly, as stated by Wikipedia."},

[[ "target-8-too-00", 8], {s: "The Saber-tooth cat is **extinct** and the Shrub-ox has **died out** too, according to the ecologists."},  
[[ "target-8-nil-00", 8], {s: "The Guam Kingfisher is nearly extinct and the Shrub-ox has died out fully, according to the ecologists."},  
[[ "target-8-too-04", 8], {s: "The Saber-tooth cat is **extinct** and the Shrub-ox, which was massively built, has **died out** too, according to the ecologists."},  
[[ "target-8-nil-04", 8], {s: "The Guam Kingfisher is nearly extinct and the Shrub-ox, which was massively built, has died out fully, according to the ecologists."},

[[ "target-9-too-00", 9], {s: "Bear Stearns was **acquired** by JPMorgan and Merrill-Lynch had to be **bought out** too, the BBC reported yesterday."},  
[[ "target-9-nil-00", 9], {s: "Lehman Brothers went bankrupt and Merrill-Lynch had to be bought out urgently, the BBC reported yesterday."},  
[[ "target-9-too-04", 9], {s: "Bear Stearns was **acquired** by JPMorgan and Merrill-Lynch, which was founded in 1914, had to be **bought out** too, the BBC reported yesterday."},  
[[ "target-9-nil-04", 9], {s: "Lehman Brothers went bankrupt and Merrill-Lynch, which was founded in 1914, had to be bought out urgently, the BBC reported yesterday."},

[[ "target-10-too-00", 10], {s: "Giraffes are **herbivores** and zebras **eat plants** too, as can be seen on animal shows."},  
[[ "target-10-nil-00", 10], {s: "Lions are carnivores and zebras eat plants often, as can be seen on animal shows."},  
[[ "target-10-too-04", 10], {s: "Giraffes are **herbivores** and zebras, which have black-and-white coats, **eat plants** too, as can be seen on animal shows."},  
[[ "target-10-nil-04", 10], {s: "Lions are carnivores and zebras, which have black-and-white coats, eat plants often, as can be seen on animal shows."},

[[ "target-11-too-00", 11], {s: "Aunt Suzy is a tea **drinker** and uncle Jim **drinks** tea too, my father stated calmly."},  
[[ "target-11-nil-00", 11], {s: "Aunt Suzy is a coffee drinker and uncle Jim drinks tea often, my father stated calmly."},  
[[ "target-11-too-04", 11], {s: "Aunt Suzy is a tea **drinker** and uncle Jim, who lived in England, **drinks** tea too, my father stated calmly."},  
[[ "target-11-nil-04", 11], {s: "Aunt Suzy is a coffee drinker and uncle Jim, who lived in England, drinks tea often, my father stated calmly."},

[[ "target-12-too-00", 12], {s: "My father is a passionate card **player** and my mom likes **playing** cards too, but I have never been into games."},  
[[ "target-12-nil-00", 12], {s: "My father is a checkers player and my mom likes playing cards sometimes, but I have never been into games."},  
[[ "target-12-too-04", 12], {s: "My father is a card **player** and my mom, who is all about work, likes **playing** cards too, but I have never been into games."},  
[[ "target-12-nil-04", 12], {s: "My father is a checkers player and my mom, who is all about work, likes playing cards sometimes, but I have never been into games."},

[[ "target-13-too-00", 13], {s: "John **ran away** from the avalanche and the lady **escaped** too, the aide reported dispassionately."},  
[[ "target-13-nil-00", 13], {s: "John set off the avalanche and the lady escaped surprisingly, the aide reported dispassionately."},  
[[ "target-13-too-04", 13], {s: "John **ran away** from the avalanche and the lady, trapped in the cave downhill, **escaped** too, the aide reported dispassionately."},  
[[ "target-13-nil-04", 13], {s: "John set off the avalanche and the lady, trapped in the cave downhill, escaped surprisingly, the aide reported dispassionately."},

[[ "target-14-too-00", 14], {s: "The family **departed** and Suzy **left** too, my sister told us."},  
[[ "target-14-nil-00", 14], {s: "The family stayed and Suzy left unexpectedly, my sister told us."},  
[[ "target-14-too-04", 14], {s: "The family **departed** and Suzy, who arrived the earliest, **left** too, my sister told us."},  
[[ "target-14-nil-04", 14], {s: "The family stayed and Suzy, who arrived the earliest, left unexpectedly, my sister told us."},

[[ "target-15-too-00", 15], {s: "Peter's face was filled up with **tears** and this made Daniel **cry** too, as John realized immediately."},  
[[ "target-15-nil-00", 15], {s: "Peter's face was tense and serious and this made Daniel cry silently, as John realized immediately."},  
[[ "target-15-too-04", 15], {s: "Peter's face was filled up with **tears** and this made Daniel, who could not stand the anticipation, **cry** too, as John realized immediately."},  
[[ "target-15-nil-04", 15], {s: "Peter's face was tense and serious and this made Daniel, who could not stand the anticipation, cry silently, as John realized immediately."},

[["target-16-too-00", 16], {s: "The teacher **cried out** in fear and the policeman **yelled** too, my mother told us."},  
[["target-16-nil-00", 16], {s: "The teacher froze in fear and the policeman yelled loudly, my mother told us."},  
[["target-16-too-04", 16], {s: "The teacher **cried out** in fear and the policeman, who was much closer, **yelled** too, my mother told us."},  
[["target-16-nil-04", 16], "", {s: "The teacher froze in fear and the policeman, who was much closer, yelled loudly, my mother told us."},

[["target-17-too-00", 17], {s: "Patricia had **gone** to the car and a few moments later the kids **left** too, and that was the end of the visit."},  
[["target-17-nil-00", 17], {s: "Patricia had picked up the phone and a few moments later the kids left swiftly, and that was the end of the visit."},  
[["target-17-too-04", 17], {s: "Patricia had **gone** to the car and a few moments later the kids, who had great time, **left** too, and that was the end of the visit."},  
[["target-17-nil-04", 17], {s: "Patricia had picked up the phone and a few moments later the kids, who had great time, left swiftly, and that was the end of the visit."},

[["target-18-too-00", 18], {s: "The first strategy is more **cost-effective**, but the second approach **works** too, the boss claimed unexcitedly."},  
[["target-18-nil-00", 18], {s: "The first strategy is very error-prone, but the second approach works well, the boss claimed unexcitedly."},  
[["target-18-too-04", 18], {s: "The first strategy is more **cost-effective**, but the second approach, which was not yet reviewed, **works** too, the boss claimed unexcitedly."},  
[["target-18-nil-04", 18], {s: "The first strategy is very error-prone, but the second approach, which was not yet reviewed, works well, the boss claimed unexcitedly."},

[["target-19-too-00", 19], {s: "She bursts into **tears** and he **cries** too, but all seems finished now."},  
[["target-19-nil-00", 19], {s: "She stops speaking and he cries abruptly, but all seems finished now."},  
[["target-19-too-04", 19], {s: "She bursts into **tears** and he, being struck by the truth, **cries** too, but all seems finished now."},  
[["target-19-nil-04", 19], {s: "She stops speaking and he, being struck by the truth, cries abruptly, but all seems finished now."},

[["target-20-too-00", 20], {s: "My head was **aching** and my leg **hurt** too, and this was unfortunate."},  
[["target-20-nil-00", 20], {s: "My head was numb and my leg hurt badly, and this was unfortunate."},  
[["target-20-too-04", 20], {s: "My head was **aching** and my leg, which was fine yesterday, **hurt** too, and this was unfortunate."},  
[["target-20-nil-04", 20], {s: "My head was numb and my leg, which was fine yesterday, hurt badly, and this was unfortunate."},

[[ "target-21-too-00", 21], {s: "The anti-conspiracy law was **introduced** in January and the anti-corruption bill was **initiated** too, the BBC reported this morning."},  
[[ "target-21-nil-00", 21], {s: "The anti-conspiracy law was cancelled in January and the anti-corruption bill was initiated yesterday, the BBC reported this morning."},  
[[ "target-21-too-04", 21], {s: "The anti-conspiracy law was **introduced** in January and the anti-corruption bill, important for the president, was **initiated** too, the BBC reported this morning."},  
[[ "target-21-nil-04", 21], {s: "The anti-conspiracy law was canceled in January and the anti-corruption bill, important for the president, was initiated yesterday, the BBC reported this morning."},

[[ "target-22-too-00", 22], {s: "Facebook **received** money, and Google was **subsidised** too, my mother pointed out."},  
[[ "target-22-nil-00", 22], {s: "Facebook used Harvard's network, and Google was subsidised hugely, my mother pointed out."},  
[[ "target-22-too-04", 22], {s: "Facebook **received** money, and Google, a huge internet brand, was **subsidised** too, my mother pointed out."},  
[[ "target-22-nil-04", 22], {s: "Facebook used Harvard's network, and Google, a huge internet brand, was subsidised hugely, my mother pointed out."},

[[ "target-23-too-00", 23], {s: "Our train was **rushing** west and Jodie was **running** too, as John observed in shock."},  
[[ "target-23-nil-00", 23], {s: "Our train was lingering west and Jodie was running quickly, as John observed in shock."},  
[[ "target-23-too-04", 23], {s: "Our train was **rushing** west and Jodie, frantic to make a sound, was **running** too, as John observed in shock."},  
[[ "target-23-nil-04", 23], {s: "Our train was lingering west and Jodie, frantic to make a sound, was running quickly, as John observed in shock."},

[[ "target-24-too-00", 24], {s: "The kids were **apologetic** and Suzy **felt sorry** too, I have suddenly realized."},  
[[ "target-24-nil-00", 24], {s: "The kids were indifferent and Suzy felt sorry instantly, I have suddenly realized."},  
[[ "target-24-too-04", 24], {s: "The kids were **apologetic** and Suzy, emotionally attached to them, **felt sorry** too, I have suddenly realized."},  
[[ "target-24-nil-04", 24], {s: "The kids were indifferent and Suzy, emotionally attached to them, felt sorry instantly, I have suddenly realized."},

[[ "target-25-too-00", 25], {s: "The robots were **functioning** and the humans were **working** too, people from the management claimed."},  
[[ "target-25-nil-00", 25], {s: "The robots were idle and the humans were working swiftly, people from the management claimed."},  
[[ "target-25-too-04", 25], {s: "The robots were **functioning** and the humans, brought for the job, were **working** too, people from the management claimed."},  
[[ "target-25-nil-04", 25], {s: "The robots were idle and the humans, brought for the job, were working swiftly, the management claimed."},

[["target-26-too-00", 26], {s: "The writing style is **important** and illustrations **help** too, the critic stated soberly."}],

[["target-26-nil-00", 26], {s: "The writing style is terrible and illustrations help much, the critic stated soberly."}],

[["target-26-too-04", 26], {s: "The writing style is **important** and illustrations, which suit the story, **help** too, the critic stated soberly."}],

[["target-26-nil-04", 26], {s: "The writing style is terrible and illustrations, which suit the story, help much, the critic stated soberly."}],

[["target-27-too-00", 27], {s: "The Motorsport Association has **evolved** over the years and the drivers have **changed** too, according to the author."}],

[["target-27-nil-00", 27], {s: "The Motorsport Association has issued new rules of conduct and the drivers have changed swiftly, according to the author."}],

[["target-27-too-04", 27], {s: "The Motorsport Association has **evolved** over the years and the drivers, pillars of the association, have **changed** too, according to the author."}],

[["target-27-nil-04", 27], {s: "The Motorsport Association has issued new rules of conduct and the drivers, pillars of the association, have changed swiftly, according to the author."}],

[["target-28-too-00", 28], {s: "Justine **cracked up** and Mary **laughed** too, while looking around her."}],

[["target-28-nil-00", 28], {s: "Justine looked worried and Mary laughed loudly, while looking around her."}],

[["target-28-too-04", 28], {s: "Justine **cracked up** and Mary, who held the cat, **laughed** too, while looking around her."}],

[["target-28-nil-04", 28], {s: "Justine looked worried and Mary, who held the cat, laughed loudly, while looking around her."}],

[["target-29-too-00", 29], {s: "Senator Pye was found **dead** and some local people were **killed** too, the FBI revealed during a conference."}],

[["target-29-nil-00", 29], {s: "Senator Pye was found missing and some local people were killed violently, the FBI revealed during a conference."}],

[["target-29-too-04", 29], {s: "Senator Pye was found **dead** and some local people, who the suspect contacted, were **killed** too, the FBI revealed during a conference."}],

[["target-29-nil-04", 29], {s: "Senator Pye was found missing and some local people, who the suspect contacted, were killed violently, the FBI revealed during a conference."}],

[["target-30-too-00", 30], {s: "The Cincinnati Bengals suffered a **loss** on Sunday and the rest of the AFC North **lost** too, the ESPN reporter stated."}],

[["target-30-nil-00", 30], {s: "The Cincinnati Bengals gained a win on Sunday and the rest of the AFC North lost badly, the ESPN reporter stated."}],

[["target-30-too-04", 30], {s: "The Cincinnati Bengals suffered a **loss** on Sunday and the rest of the AFC North, which looked strong earlier, **lost** too, the ESPN reporter stated."}],

[["target-30-nil-04", 30], {s: "The Cincinnati Bengals gained a win on Sunday and the rest of the AFC North, which looked strong earlier, lost badly, the ESPN reporter stated."}],

[["target-31-too-00", 31], {s: "The husky **halted** and the man **stopped** too, and they were still for a second."}],

[["target-31-nil-00", 31], {s: "The husky jumped and the man stopped suddenly, and they were still for a second."}],

[["target-31-too-04", 31], {s: "The husky **halted** and the man, seemingly scared by the noise, **stopped** too, and they were still for a second."}],

[["target-31-nil-04", 31], {s: "The husky jumped and the man, seemingly scared by the noise, stopped suddenly, and they were still for a second."}],

[["target-32-too-00", 32], {s: "This time Sonia was a **winner** but Jessie was **good** too, I thought with pleasure."}],

[["target-32-nil-00", 32], {s: "This time Sonia was injured but Jessie was good enough, I thought with pleasure."}],

[["target-32-too-04", 32], {s: "This time Sonia was a **winner** but Jessie, who had a rough start, was **good** too, I thought with pleasure."}],

[["target-32-nil-04", 32], {s: "This time Sonia was injured but Jessie, who had a rough start, was good enough, I thought with pleasure."}],

**Table with all results**

nr	target	add_target	antecedent	add_antecedent2	cosine_similarity	difference_short	difference_long
1	dancer		dance		0.699232172506	0.118983539920072	0.180339809657831
2	painter		paint		0.595018130964	-0.155420664814853	-0.149622067162084
3	shut	down	close		0.38587661879	-0.070495934768805	0.00227440720144756
4	eat		have	food	0.140156521209	-0.207200579357361	-0.251434402980712
5	predator		hunt	prey	0.262699948555	0.158217101217977	0.206527654729629
6	secrete	poison	poisonous		0.242474667206	-0.369991781287172	-0.31099435383187
7	hunter		hunt		0.642520245148	0.215910282317829	0.16951574252606
8	extinct		die	out	0.26695477227	-0.158404611978685	-0.131870023052673
9	acquire		buy	out	0.38880776317	0.0520304834340468	-0.0423615579086292
10	herbivores		eat	plants	0.223860886225	-0.083069794306535	0.0309871592889266
11	drinker		drink		0.610005801127	0.0148194401960966	0.090696493277636
12	player		play		0.465446923612	-0.25285383733228	-0.355234934878604
13	run	away	escape		0.223614918592	-0.035857890646800	-0.0145469872232589
14	depart		leave		0.604547582366	-0.151247930455166	-0.151554112182494
15	tears		cry		0.5747932352	0.0347518321212981	0.066913138349749
16	cry	out	yell		0.490296082317	-0.056714046509037	-0.0749350128765833
17	go		leave		0.494690849321	0.111659956839469	0.0564221693349483
18	cost-effective		work		0.15440705109	-0.036310352912297	-0.0345348621250681
19	tears		cry		0.5747932352	0.0283931886329558	0.104334557155141
20	ache		hurt		0.425192645604	-0.13049983057492	-0.125280923649957
21	introduce		initiate		0.392095071666	0.0185354492017433	0.152259715727624
22	receive		subsidised		0.241774788671	-0.291353836682251	-0.225676127969367
23	rush		run		0.304012691001	0.0998238483578078	-0.0658314958665436
24	apologetic		feel	sorry	0.146776677276	-0.088847543405796	-0.0785200587668067
25	function		work		0.286542588104	0.0777259986477645	0.0240367780712045
26	important		help		0.222892873053	-0.202090749763904	-0.277266139621264
27	evolve		change		0.444635576639	0.15347875367452	0.127030506488432
28	crack	up	laugh		0.293414888586	-0.193212190994796	-0.102802046739252
29	dead		killed		0.590714804067	0.0454756093980357	0.163688072508428
30	loss		lose		0.544781709688	-0.121574115705369	-0.0708363585495784
31	halt		stop		0.573778651525	0.077288410934222	-0.0435402586575613
32	winner		good		0.191031142851	-0.099750351428810	-0.157513596830456



## Python code used to subtract vectors from FastText

```
import io
import csv

def load_vectors(fname):
    fin = io.open(fname, 'r', encoding='utf-8', newline='\n', errors='ignore')
    n, d = map(int, fin.readline().split())
    data = {}

    x=0
    for line in fin:
        tokens = line.rstrip().split(' ')
        data[tokens[0]] = map(float, tokens[1:])
        x += 1
    print(x)
    return data

datavectoren = load_vectors("vectors.vec")

def dot(woord1, woord2):
    return (sum(a*b for a,b in zip(woord1,woord2)))

def cosine_similarity(woord1, woord2):
    return dot(woord1, woord2)/( (dot(woord1,woord1) **.5) * (dot(woord2,woord2) **.5) )

def listmaken(vector):
    lijst = []
    for i in vector:
        lijst.append(i)
    return lijst

header = ['sentence', 'word1', 'add_word1', 'word2', 'add_word2', 'cosine_similarity']
```

```
dataset2 = [  
  ["1", "dancer", "", "dance", ""],  
  ["2", "painter", "", "paint", ""],  
  ["3", "shut", "down", "close", ""],  
  ["4", "eat", "", "have", "food"],  
  ["5", "predator", "", "hunt", "prey"],  
  ["6", "secrete", "poison", "poisonous", ""],  
  ["7", "hunter", "", "hunt", ""],  
  ["8", "extinct", "", "die", "out"],  
  ["9", "acquire", "", "buy", "out"],  
  ["10", "herbivores", "", "eat", "plants"],  
  ["11", "drinker", "", "drink", ""],  
  ["12", "player", "", "play", ""],  
  ["13", "run", "away", "escape", ""],  
  ["14", "depart", "", "leave", ""],  
  ["15", "tears", "", "cry", ""],  
  ["16", "cry", "out", "yell", ""],  
  ["17", "go", "", "leave", ""],  
  ["18", "cost-effective", "", "work", ""],  
  ["19", "tears", "", "cry", ""],  
  ["20", "ache", "", "hurt", ""],  
  ["21", "introduce", "", "initiate", ""],  
  ["22", "receive", "", "subsidised", ""],  
  ["23", "rush", "", "run", ""],  
  ["24", "apologetic", "", "feel", "sorry"],  
  ["25", "function", "", "work", ""],  
  ["26", "important", "", "help", ""],  
  ["27", "evolve", "", "change", ""],  
  ["28", "crack", "up", "laugh", ""],  
  ["29", "dead", "", "killed", ""],
```

```

["30", "loss", "", "lose", ""],
["31", "halt", "", "stop", ""],
["32", "winner", "", "good", ""]
]

for rijen in dataset2:
    if (rijen[0] == "3" or rijen[0] == "6" or rijen[0] == "13" or rijen[0] == "16" or rijen[0] == "28"):
        cos_sim = cosine_similarity((listmaken(datavectoren[rijen[1]] + listmaken(datavectoren[rijen[2]])),
listmaken(datavectoren[rijen[3]]))
    elif (rijen[0] == "4" or rijen[0] == "5" or rijen[0] == "8" or rijen[0] == "9" or rijen[0] == "10" or rijen[0] == "24"):
        cos_sim = cosine_similarity(listmaken(datavectoren[rijen[1]]), (listmaken(datavectoren[rijen[3]] +
listmaken(datavectoren[rijen[4]])))
    else:
        cos_sim = cosine_similarity(listmaken(datavectoren[rijen[1]]), listmaken(datavectoren[rijen[3]])

    rijen.append(str(cos_sim))

with open('data_scriptie3.csv', 'w') as f:
    writer = csv.writer(f)

    # write the header
    writer.writerow(header)

    # write multiple rows
    writer.writerows(dataset2)

```