Supplementary Material for the Paper:
Excitatory or Inhibitory: A New Semantic Orientation Extracts Contradiction and Causality from the Web

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A Preface

This supplementary material describes the list of seed templates, the list of connectives, the English translations of our annotation manuals, and additional examples of contradiction, causality, and the causality hypothesis. Although this supplementary material may seem oversupplied, we believe that we must describe all of the details, since we propose a novel concept, Excitation, a novel task, Excitation knowledge acquisition, and novel knowledge acquisition methods based on Excitation in our paper.

B List of Seed Templates

In this section, we list the seed templates that we used to acquire the Excitation templates. We mentioned the seed templates in Section 3. In the following, each seed template is followed by its gloss and an English translation. ACC, DAT, NOM, and TOP denote Japanese accusative, dative, nominative, and topic case markers.

- excitatory seed templates:

  1. X を する (X ACC do) 'do X'
  2. X を 行う (X ACC do) 'do X'
  3. X に なる (X DAT become) 'become X'
  4. X を 作る (X ACC make) 'make X'
  5. X を つくる (X ACC make) 'make X'
  6. X を 作成する (X ACC make) 'make X'
  7. X が 有る (X NOM exist) 'there is X'
  8. X が 出来る (X NOM possible) 'X appears / X is possible'
  9. X は 出来る (X TOP possible) 'X appears / X is possible'
  10. X を 引き起こす (X ACC cause) 'cause X'
  11. X を 起こす (X ACC cause) 'cause X'
  12. X を おこす (X ACC cause) 'cause X'
  13. X が 起こる (X NOM happen) 'X happens'
  14. X が 起きる (X NOM happen) 'X happens'
  15. X が しょうずる (X NOM happen) 'X happens'
  16. X が 発生する (X NOM happen) 'X happens'
  17. X を 発生させる (X ACC bring about) 'bring about X'
  18. X を 持つ (X ACC have) 'have X'
  19. X を 与える (X ACC give) 'give X'
  20. X が 多い (X NOM abundant) 'X is abundant'
  21. X が 進む (X NOM progress) 'X makes progress'
  22. X が 進行する (X NOM progress) 'X makes progress'
  23. X を 加える (X ACC add) 'add X'
  24. X が 増える (X NOM increase) 'X increases'
  25. X が 始まる (X NOM start) 'X starts'
  26. X を 始める (X ACC start) 'start X'
  27. X が 続く (X NOM continue) 'X continues'
  28. X を 繰り返す (X ACC repeat) 'repeat X'
  29. X を 得る (X ACC acquire) 'acquire X'
  30. X に 繋がる (X DAT lead to) 'lead to X'

31. X が 強い (X NOM strong) 'X is strong'

32. X を 混ぜる (X ACC mix) 'mix X'

33. X を 使う (X ACC use) 'use X'

34. X を 使用する (X ACC use) 'use X'

35. X を 用いる (X ACC use) 'use X'

36. X を 利用する (X ACC utilize) 'utilize X'

- inhibitory seed templates:

  1. X が 無い (X NOM absent) 'X is absent'

  2. X は 無い (X TOP absent) 'X is absent'

  3. X が なくなる (X NOM disappear) 'X disappears'

  4. X を 防ぐ (X ACC prevent) 'prevent X'

  5. X を 予防する (X ACC prevent) 'prevent X'

  6. X を 防止する (X ACC prevent) 'prevent X'

  7. X を 抑える (X ACC suppress) 'suppress X'

  8. X を 止める (X ACC stop) 'stop X'

  9. X が 止まる (X NOM stop) 'X stops'

  10. X を 取り除く (X ACC remove) 'remove X'

C List of Connectives

This section lists the connectives mentioned in Section 3.1 that we used to acquire the Excitation templates. They are 169 connectives in total.

These connectives were first automatically extracted from our web corpus that was parsed by KNP, a Japanese dependency parser.[1] KNP distinguishes connectives that have the same surface form but (slightly) different grammatical functions. We follow KNP in distinguishing these connectives and note below the connectives that have the same surface form to indicate what distinguishes them.

Connectives were manually classified by one of the authors into AND/THUS-type and BUT-type. AND/THUS-type connectives were further classified into causal connectives and non-causal connectives.

Causal connectives explicitly indicate a sort of causality or logical consequence between two events

[1] http://nlp.ist.i.kyoto-u.ac.jp/EN/index.php?KNP

denoted by two phrases between which the connectives are placed. The functions of non-causal connectives include contrasting two phrases as alternatives to each other, juxtaposing two phrases on equal footing, inserting one phrase as an additional explanation or description on the other phrase, and sometimes indicating causality between two events described by two phrases between which the connectives are placed. BUT-type connectives indicate inconsistency between two events denoted by two phrases between which the connectives are placed.

Note that our "connectives" include some conjugation forms of Japanese predicates, since they can take on functional meanings that (authentic) connectives have.

Note also that, in the following connectives list, we distinguish connectives with the same surface form by their usages described in parentheses.

BUT-type connectives BUT-type connectives are as follows; が, くても, くも, けれども, ても, であっても, でなく, とはいえ, ど, ながらも, にもかかわらず, ものの, 半面, and 反面. They are 14 connectives in total.

Causal connectives The causal connectives, one type of AND/THUS-type connectives, are as follows; から, ことから, ため, たら, と, なら, のだから, ので, ば, ば (preceded by an argument marked by postposition も), お陰, せい, 場合, 故, 為, and 結果. They are 16 connectives in total.

Non-causal connectives The non-causal connectives, another type of AND/THUS-type connectives, are as follows; うものなら, からで, きや, きり, く, く (immediately followed by a predicate), くて, くては, くは, こうが, こうと, し, ず, ずに, たり, たり (attached to an adjective), だけ, だけに, だとか, ちゃ, つつ, て, て (immediately followed by a predicate), ており, てから, ては, て以来, で, で (attached to a noun), で (immediately followed by a predicate), であって, であっては, であり, であれ, でして, では, でも, で (は) なく, とか, として, とともに, どころか, ないで, ながら, など, など (immediately preceded by a punctuation mark such as a comma), なり, に, に (immediately preceded by such specific nouns as 基, もと, 前提, 中心, めど, メド, 基準, 契機, きっかけ, 機, 境, and so on), において, にしろ, にせよ, について, にとって, には, にも, によって, によらず, に並んで, に代わって,

に伴って, に加えて, に合わせて, に向けて, に基づいて, に対して, に比べて, に沿って, に絡んで, に続いて, に関して, に限って, に限らず, のだったり, のなら, のに, のに対し, のみならず, のように, または, または (immediately preceded by verbal nouns (サ変動詞)), まで, まま, もまた, やいなや, ようだったり, ようで, ように, より, わけに (は), を含めて, を始めて, を巡って, を通じて, を除いて, (が) ために, あまり, うち, くせ, くらい, しろ, たび, ついで, とこ, ところ, まま, 一方, 上, 中, 他, 代わり, 以上, 以外, 前, 後, 折り, 方, 旨, 時, 最中, 様, 毎, 矢先, 程, 程度, 途中, 途端, 通り, 間, 限り, 際, 頃, (と) 同様, (は) もちろん, punctuations (e.g., commas), adverbial nouns immediately preceded by a predicate Renyou-kei conjugation forms, specific Renyou-kei conjugation forms that consist of multiple morphemes (e.g., によると, によりますと, and というと), and other specific conjugation forms that sometimes function similarly to Renyou-kei forms (e.g., 静かながら, できるだけ, and 堂々として). They are 139 connectives in total.

D English Translation of Annotation Manuals

In this section, we present the English translation of our annotation manuals and annotation examples that we prepared in Japanese to instruct our annotators.

D.1 Excitation Template Acquisition

Figure I shows the English translation of our annotation manual for our Excitation template acquisition experiment. The following are examples that we prepared to instruct the annotators. The argument slot of the template was filled with a noun (underlined).

- Examples for excitatory
  - 津波 が 発生する (Tsunami NOM generate) 'Tsunami is generated'
  - 財産 が 増える (fortune NOM increase) 'fortune increases'
  - ゆとり が 有る (capacity NOM exist) 'have capacity'
  - 余裕 を 持つ (margin ACC have) 'have a margin'
  - バイ菌 が 多い (germ NOM abundant) 'germs are abundant'

- 夕飯 を 準備する (dinner ACC prepare) 'prepare dinner'
- ジャガイモ を 茹でる (potato ACC boil) 'boil potatoes'
- 教科書 を 買う (textbook ACC buy) 'buy a textbook'
- 鉛筆 を 削る (pencil ACC chop) 'sharpen a pencil'
- ヒアルロン酸 に 変化する (hyaluronic acid DAT change) 'turn into hyaluronic acid'
- 人員 を 分ける (personnel ACC distribute) 'divide personnel'
- 勉強 に 集中する (study DAT concentrate) 'focus on studying'
- お金 を 消費する (money ACC consume) 'consume money'
- 脂肪 を 燃焼させる (fat ACC burn) 'burn fat'

- Examples for inhibitory
  - 風邪 を 予防する (cold ACC prevent) 'prevent colds'
  - 不安 を 取り除く (fear ACC eliminate) 'eliminate a fear'
  - 自信 が 無い (confidence NOM absent) 'have no confidence'
  - 心臓 が 止まる (heart NOM stop) 'heart stops'
  - 機会 を 奪う (chance ACC deprive) 'deprive of a chance'
  - 機会 を 奪われる (chance ACC be deprived) 'a chance is deprived'
  - 予算 が 減少する (budget NOM reduce) 'budget is reduced'
  - 成長 が 伸び悩む (growth NOM stagnate) 'growth stagnates'
  - 法律 に 背く (law DAT violate) 'violate a law'
  - 手順 を 間違う (procedure ACC make mistakes) 'fail to follow a procedure'
  - 侵略 を 食い止める (invasion ACC stop) 'repel an invasion'
  - クロロゲン酸 から 変化する (chlorogenic acid FROM change) 'change from chlorogenic acid'

Figure I: English translation of annotation manual for Excitation template acquisition experiments

- 負荷 を 分散させる (load ACC distribute) 'distribute a load'

- 勉強 に 飽きる (study DAT get bored) 'get bored of studying'

- 将来 を 考える (future ACC think) 'think about the future'

- 明日 を 思う (tomorrow ACC think) 'think about tomorrow'

- Examples for neutral

  - 人口 に 比例する (population DAT in proportion to) 'in proportion to population'

  - 性格 を 診断する (personality ACC diagnose) 'diagnose a personality'

  - 心象 を 描写する (mental picture ACC describe) 'describe a mental picture'

  - 顔 が 不細工だ (face NOM ugly) 'a face is ugly'

D.2 Contradiction Extraction

Figure II shows the English translation of the annotation manual for our contradiction extraction experiments. The following are examples that we prepared to instruct the annotators.

- Examples of contradictory phrase pairs:

  - 景気が良くなる ⊥ 景気が悪くなる *'economic conditions get better ⊥ economic conditions get worse'*

Figure II: English translation of annotation manual for contradiction extraction experiments

– 景気が良くなる ⊥ 景気を悪くする
'*economic conditions get better ⊥ make economic conditions worse*'

– 景気が良くなる ⊥ 景気を悪化させる
'*economic conditions get better ⊥ make economic conditions worse*'

– 信頼性が増す ⊥ 信頼性が低下する
'*credibility is enhanced ⊥ credibility is degraded*'

– 癌に罹る ⊥ 癌を予防する
'*develop cancer ⊥ prevent cancer*'

– デフレになる ⊥ デフレを脱却する
'*stuck in deflation ⊥ overcome deflation*'

– デフレが促進される ⊥ デフレを抑制させる
'*accelerate deflation ⊥ discourage deflation*'

– 体力が上がる ⊥ 体力を維持する
'*improve physical strength ⊥ keep physical strength*'

– 権限を失う ⊥ 権限を保持する
'*revoke authority ⊥ maintain authority*'

– 気分がいい ⊥ 気分が悪い
'*feel good ⊥ feel bad*'

– 負荷が少なくなる ⊥ 負荷を伴う
'*reduce a burden ⊥ add a burden*'

– 凹凸が生じる ⊥ 凹凸を避ける
'*have bumps ⊥ avoid bumps*'

– トラブルが生じる ⊥ トラブルを吸収する
'*troubles occur ⊥ alleviate troubles*'

– 音が放出される ⊥ 音を軽減させる
'*make noise ⊥ reduce noise*'

– 場が激減する ⊥ 場を得られる
'*opportunity decreases drastically ⊥ opportunity is obtained*'

– エストロゲンが作用する ⊥ エストロゲンが減少する
'*estrogen exerts its effects ⊥ estrogen decreases*'

– ピークに至る ⊥ ピークを避ける
'*achieve a peak ⊥ avoid a peak*'

– 揺れが軽減される ⊥ 揺れを生ずる
'*shaking is reduced ⊥ shaking occurs*'

– 臭気が減少する ⊥ 臭気を放出する
'*reduce smells ⊥ emit smells*'

– クッション性が軽減する ⊥ クッション性を生む
'*reduce cushioning characteristics ⊥ cause cushioning characteristics*'

– ロゴが出現する ⊥ ロゴをカットする
'*a logo appears ⊥ remove a logo*'

– コエンザイムＱ１０が不足する ⊥ コエンザイムＱ１０が含まれる
'*Coenzyme Q-10 runs short ⊥ Coenzyme Q-10 is included*'

– 回転が増す ⊥ 回転を吸収する
'*(number of) rotations increases ⊥ absorb (the shock of) rotations*'

– 水分が落ちる ⊥ 水分をためる
'*fluid is lost ⊥ retain fluid*'

– 行動が鈍る ⊥ 行動を呼び起こす
'*movement becomes slower ⊥ cause movement*'

– 勢いが得られる ⊥ 勢いを吸収する
'*gain momentum ⊥ absorb momentum*'

– 本が出る ⊥ 本が無くなる
'*a book is published ⊥ a book disappears*'

– 熱を感じる ⊥ 熱を軽減する
'*feel heat ⊥ decrease heat*'

– 出血が出る ⊥ 出血が減る
'*bleeding occurs ⊥ bleeding is reduced*'

– 付着をカットする ⊥ 付着を誘発する
'*prevent adherence ⊥ induce adherence*'

– 毒素が出る ⊥ 毒素を落とす
'*a toxin is secreted ⊥ detoxify a toxin*'

– 研究を怠る ⊥ 研究を行える
'*neglect the research ⊥ can do the research*'

• Examples of non-contradictory phrase pairs:

– 温度が上がる ⊥̸ 温度が上昇する
'*temperature rises ⊥̸ temperature increases*'

– 温度が上がる ⊥̸ 温度を上昇させる
'*temperature rises ⊥̸ increase temperature*'

– 癌に罹る ⊥̸ 癌を研究する
'*develop cancer ⊥̸ study cancer*'

– 温度が上がる ⊥̸ 温度をチェックする
'*temperature rises ⊥̸ check temperature*'

– 温度が高い ⊥̸ 温度は高い
'*temperature is high ⊥̸ temperature is high*'

– 映画を鑑賞する ⊥̸ 映画を観る
'*appreciate a movie ⊥̸ watch a movie*'

– 税金が軽減される ⊥̸ 税金を低減させる
'*a tax is abated ⊥̸ cut a tax*'

– ガキと呼ぶ ⊥̸ ガキをつくる
'*call someone a child ⊥̸ give birth to a child*'

D.3 Causality Extraction

Figure III shows the English translation of the annotation manual for causality extraction experiments. The following are examples that we prepared to instruct the annotators.

• Examples of causality phrase pairs:

– タバコを吸う ⇒ 肺癌になる
smoke cigarettes ⇒ suffer lung cancer

– 基礎代謝が落ちる ⇒ 消費カロリーが減る
basal metabolism decreases ⇒ calories are burned reduce

– 湿度が高い ⇒ カビが発生する
humidity level is high ⇒ mold grows

– 地震が少ない ⇒ 不安が少ない
earthquakes rarely occur ⇒ anxiety is rarely felt

– 好奇心が刺激される ⇒ 興味がわく
curiosity is stimulated ⇒ have an interest

– 脂質を大量摂取する ⇒ 脂肪を増加させる
intake a large amount of fat ⇒ increase body fat

– 金額が減る ⇒ 人が減る
amount of money is reduced ⇒ number of persons is reduced
(Given the context of company employment)

• Examples of non-causality phrase pairs:

– タバコを吸う ⇏ 健康になる
smoke cigarettes ⇏ become healthy

– タバコを吸う ⇏ 会社に行く
smoke cigarettes ⇏ go to work

– 肺癌になる ⇏ タバコを吸う
suffer lung cancer ⇏ smoke cigarettes

– 不安が少ない ⇏ 地震が多い
anxiety is rarely felt ⇏ earthquakes rarely occur

– 子供が生まれる ⇏ 税率を上げさせる
have a baby ⇏ raise taxes

- 空が青い ⇏ イベントが中止される
  sky is blue ⇏ an event is canceled
- 家をあげる ⇏ 電気がつかない
  give a house ⇏ electricity isn't working

- Examples of 'undecided' cases:

  - 金が高い ⇒ 加工があがる
    gold is expensive ⇒ processing is finished
    (Assume that *processing is finished* is extracted incorrectly from *processing is cheaply-finished*. For cases of such mis-extraction, 'undecided' may be used.)
  - シークレットが増す ⇒ 顧客満足度を高める
    secret increases ⇒ improve customer satisfaction
    (Assume that *secret increases* is originally *(keeping) a secret increases reliability and safety*. This is another kind of mis-extraction since what is increased is different from the original phrase.)

D.4 Causality Hypothesis Generation

Figure IV shows the English translation of the annotation manual for causality hypothesis generation experiment. Examples used to instruct the annotators were identical to those in Section D.3.

E Additional Examples of Knowledge Acquisition

In the following sections we give additional examples of contradiction pairs, causality pairs, and causality hypothesis pairs acquired by our proposed knowledge acquisition methods.

E.1 Contradiction Extraction

Table I shows additional examples of contradiction pairs extracted by PROP_{cont}. They were selected from the 200 evaluated samples of PROP_{cont}. 'Cont' and 'Quasi' indicate whether the pair is contradictory or quasi-contradictory.

E.2 Causality Extraction

Table II shows additional examples of causality pairs extracted by PROP_{caus}. They were selected from the 100 evaluated samples of PROP_{caus}. '✔' indicates that the pair has causality.

E.3 Causality Hypothesis Generation

Table III shows additional examples of causality hypothesis pairs generated by PROP_{hyp}. They were selected from the 100 evaluated samples of PROP_{hyp}. '✔' given to the hypotheses and their original causality pairs indicates that the pair has a causal relation.

Rank	Contradiction Pairs	Label
77,815	通行が確保される ⊥ 通行が制限される	Quasi
	passage is ensured ⊥ passage is restricted	
353,846	売上が激減する ⊥ 売上が倍増する	Cont
	sales drop sharply ⊥ sales are doubled	
749,952	人影がある ⊥ 人影はなくなる	Cont
	a human figure is present ⊥ a human figure disappears	

Table I: Additional examples of PROP$_{cont}$'s outputs

Rank	Causality Pairs	Label
14,649	放送倫理を高める ⇒ 番組を向上させる	✔
	raise broadcasting ethics ⇒ improve broadcast programs	
533,106	棚板を増やす ⇒ 収納効率を良くする	✔
	add shelves ⇒ improve storage efficiency	
829,122	客まんぞく度を向上させる ⇒ 収益を上げる	✔
	improve client satisfaction level ⇒ boost revenues	

Table II: Additional examples of PROP$_{caus}$'s outputs

Rank	Causality Hypotheses (and their Origins)	Label
19,220	体力を増進する ⇒ 老化を抑制する	✔
	(体力を低下させる ⇒ 老化を促進させる)	✔
	increase physical strength ⇒ prevent aging	
	(decrease physical strength ⇒ accelerate aging)	
69,913	アレルギーを改善する ⇒ 蕁麻疹は治る	✔
	(アレルギーを起こす ⇒ 蕁麻疹が発症する)	✔
	relieve allergies ⇒ remedy for hives	
	(cause allergies ⇒ develop hives)	
147,483	病気が少なくなる ⇒ 生育が促進される	✔
	(病気を起こす ⇒ 生育が妨げられる)	✔
	diseases reduce ⇒ growth is facilitated	
	(develop diseases ⇒ growth is hindered)	
725,268	便秘を解消させる ⇒ 老化を遅らせる	✔
	(便秘を引き起こす ⇒ 老化を促進する)	✔
	relieve constipation ⇒ delay aging	
	(cause constipation ⇒ accelerate aging)	
874,036	消費をもたらす ⇒ 売上を増やす	✔
	(消費を減少する ⇒ 売上を減少させる)	✔
	encourage consumption ⇒ increase sales	
	(discourage consumption ⇒ cut into sales)	

Table III: Additional examples of PROP$_{hyp}$'s output

Causality Annotation Manual

Task   Classify the phrase pairs that consist of a noun and a template such as *smoke cigarettes ⇒ get lung cancer*, *smoke cigarettes ⇒ get healthy*, and *smoke cigarettes ⇒ go to work* as causality or not. The following are the classification criteria:

Causality A phrase pair such that the probability of the event, action, or state denoted by the right-side phrase becomes higher when the event, action, or state denoted by the left-side phrase happens compared to when it does not happen. Note that the event of the left-side phrase temporally precedes that of the right-side phrase.

Non-causality A phrase pair such that the probability of the event, action, or state denoted by the right-side phrase becomes higher when the event, action, or state denoted by the left-side phrase does not happen compared to when it happens. Alternatively, a phrase pair such that the left-side phrase's event, action, or state does not affect the probability of the right-side phrase's event, action, or state.

You may use the following linguistic test to make judgments by putting the left- and right-side phrases in the questions into X and Y and checking whether the resulting sentence is valid; causality if it is valid, and non-causality otherwise.   **Linguistic test:** "Y becomes more likely when X happens compared to when X does not happen." (X is the event, action, or state denoted by the left-side phrase, and Y is the event, action, or state denoted by the right-side phrase.)

   A source sentence from which a target causality pair was extracted is given next to the causality pair. Your judgments must be based on these source sentences. You may consult the web for the meaning of phrases. However, do not consult other annotators. You may use the label 'undecided' when you are not sure about the causality status of phrase or when you think that a phrase is too unnatural or awkward in Japanese.

Note 1: Even if the right-side phrase denotes an event, action or state that happens only when multiple events, actions or states all happen, judge a phrase pair as causality if the left-side phrase denotes one multiple event, action, or state. In the case of *propose marriage ⇒ a couple gets married*, not only proposing marriage but also accepting the proposal are necessary for a couple to get married. But the phrase pair has causality, since the probability of a couple's getting married is higher when marriage is proposed than when it is not proposed.

Note 2: A phrase pair that represents "causality" that is too exceptional or has no generality should be judged as non-causality. *Istvan joins dinner ⇒ a vegetarian menu is adopted* is an example.

Note 3: A phrase pair that represents "causality" with which not all persons agree should be judged as causality if you find evidence for it. *drink black oolong ⇒ interfere with fat absorption* is judged as causality if you find descriptions that validate its ability to interfere with fat absorption.

Note 4: A phrase pair may contain a noun that is semantically ambiguous. In that case, base your judgment on the most plausible sense for the noun given the meaning of the phrase pair. In the case of *burden is imposed ⇒ suffer backache*, *burden* should be interpreted as physical rather than psychological or economical.

Note 5: Compound nouns in the phrase pairs are split into base form single morphemes. Interpret them as if their morphemes have proper conjugation forms.

Note 6: Some phrase pairs were assigned irrelevant sentences as their origin, which was cased by a bug in the web corpus construction. In that case, do not consider the wrong sentences for making judgments.

Figure III: English translation of annotation manual for causality extraction experiments

Causality Hypothesis Annotation Manual

(Read also Causality Annotation Manual.)

Task Classify phrase pairs that consist of a noun and a template such as *smoke cigarettes* ⇒ *get lung cancer*, *smoke cigarettes* ⇒ *get healthy*, and *smoke cigarettes* ⇒ *go to work* as causality or not. The following are the classification criteria:

Causality A phrase pair such that the probability of the event, action, or state denoted by the right-side phrase becomes higher when the event, action, or state denoted by the left-side phrase happens compared to when it does not happen. Note that the event of the left-side phrase temporally precedes that of the right-side phrase.

Non-causality A phrase pair such that the probability of the event, action, or state denoted by the right-side phrase becomes higher when the event, action, or state denoted by the left-side phrase does not happen compared to when it happens. Alternatively, a phrase pair such that the left-side phrase's event, action, or state does not affect the probability of the right-side phrase's event, action, or state.

You may use the following linguistic test to make judgments by putting the left- and right-side phrases in the question into X and Y and checking whether the resulting sentence is valid; causality if it is valid, and non-causality otherwise. **Linguistic test:** "Y becomes more likely when X happens compared to when X does not happen." (X is the event, action, or state denoted by the left-side phrase, and Y is the event, action, or state denoted by the right-side phrase.)

   Each line of the annotation file consists of columns: "Phrase 1," "Phrase 2," "Original Phrase 1," "Original Phrase 2," and "Source Sentence of Original Phrases 1 and 2." Judge whether "Phrase 1" is a cause of "Phrase 2." They were automatically generated from "Original Phrase 1" and "Original Phrase 2," which were extracted from the "Source Sentence of Original Phrases 1 and 2." When making judgments, check "Original Phrase 1," "Original Phrase 2," and the "Source Sentence of Original Phrases 1 and 2" and consider the meaning of the nouns and predicates in them. You may consult the web for the meaning of the phrases. However, do not consult other annotators. You may use the label 'undecided' when you are not sure about the causality status of the phrase or when you think that a phrase is too unnatural or awkward in Japanese.

(The same six notes written in the manual for causality extraction in Fig. III follow.)

Figure IV: English translation of annotation manual for causality hypothesis generation experiment.