Detailed Guide to Philadelphia Naming Test (PNT) Scoring

Part I of this guide defines the terms, procedures, and error categories relevant to *Conventional Scoring* of the PNT. Part II explains the modifications to the system required for application of the weight-decay or semantic-phonologic naming model (*Model Scoring*) (e.g., Dell et al., 1997; Schwartz et al., 2006; and to apply the model-fitting program: http://langprod.cogsci.uiuc.edu/cgi-bin/webfit.cgi). Part III describes a more elaborate, two-level coding system for the PNT (Roach et al., 1996). Throughout this guide, targets are shown in parentheses, responses are in quotation marks.

Part I: Conventional Scoring

Complete Attempt (C): On each trial, score the subject's first "Complete Attempt", defined as: The first minimally CV (consonant-vowel) or VC response (schwa is <u>not</u> counted as a vowel) that meets one of the following criteria:

1) The attempt is not self-interrupted (cut-off) and has clear downward or upward/questioning intonation; may or may not be separated from a subsequent attempt by a noticeable pause.

2) The attempt is not self-interrupted (cut-off), is spoken with level intonation, and is followed by a noticeable pause (informal 1 sec. count). If there is no noticeable pause preceding a subsequent attempt, the attempt is not complete (see "Fragment").

Multisyllabic targets (3 or more syllables) have special considerations:
- Unless the following exceptions apply, a complete attempt to a multisyllabic target can <u>not</u> be monosyllabic.

  e.g., (helicopter)→"cop"   not a complete response (see "Fragment)

  (microscope)→"cup"   not a complete response (see "Fragment")

  Exceptions: the monosyllabic response is related to the target semantically or comprises one of its morphemes; in this case, the attempt is considered complete and scored as an error:

  e.g., (octopus)→ "squid"   a complete response (see "Semantic Error")

  (cheerleaders)→ "cheer"   a complete response (see "Morpheme Omission" under "Miscellaneous")

Additional scoring examples follow:

(iron)→   "uh <u>key</u> /ʃ-/ /s::ɪt/ key /ʃər-/ you do those thing upstairs"
　　　　　　　　　　C

(belt)→   "/ʃpə/ ←*(schwa)* <u>/bɛn/</u> /bɛnt/ /'bɛn-təl/ it's a /bɛnt/, it's a /bɛnt/ oh"
　　　　　　　　　　　　　　　　C

(thermometer)→ "/fɪl-/ ←*(self-interrupted)* <u>/fɪl-'ɑm-ə-Də/</u> /ə-'θɑm-ə-Də/ /bə-'θɑm/"
　　　　　　　　　　　　　　　　　　C

(eskimo)→   "oh the /sko::/ ←*(level intonation and no noticeable pause before the next response)*

/skot/ uh uh man that in the winter"
　　　　　C

Correct (√):   The target as given on the score-sheet; with the following exceptions:

target	alternate correct response
#26 (waterfall)➔	"falls"
#124 (mountain)➔	"mountain top"

- Allow for addition or deletion of plural morpheme.
- Allow for addition of prepositional phrase *e.g.,* (can) ➔ "<u>can</u> of peas".
- Allow for addition of modifier, *e.g.,* (bone) ➔ "dog's <u>bone</u>".
- If the subject says "type of X" where X is the target, the answer is correct.
- Do not penalize non-standard English speakers for omission of the final consonant in consonant clusters   *e.g.,* (desk)➔"/dɛs/ ", if it is consistent with their dialectal pattern.
- <u>Optional lenient scoring</u>: Patients with a motor speech disorder (e.g., dysarthria, speech apraxia) may be allowed one sound omission, addition, or substitution per response when considering correctness.

Description (D): A response that provides a characterization of the target, or attempts to explain its function or purpose.

> *e.g.,* (fireplace)➔ "that's where you put the /w/ /wud/."
> (well) ➔ "in a ringer around under all of it has water"

The following are coded as Description:
- A single verb, adjective, or adverb that has a semantic relationship to the target is coded as Description, <u>not</u> Semantic,
   > *e.g.,* (skis) ➔"skiing",
   > (dinosaur)➔ "scary "
   > (scarf) ➔"outside"
- A single verb, adjective or adverb that has <u>no</u> relationship to the target or does not characterize it in any way is also coded as Description,
   > *e.g.,* (beard)➔"hit"
- A response in the form "type of X" where "X" is a <u>superordinate</u> of the target.
   > *e.g.,* (apple)➔ "type of fruit"
- A response that negates the target, *e.g.,* (dinosaur)➔ "<u>not a</u> dinosaur"
- A response that includes a carrier phrase with the name of the target,
   > *e.g.,* (door)➔"open the door"

Response types that <u>do not</u> meet the criteria for Description:
- A response that is a general or personal commentary, *e.g.,* (strawberry)➔"I had them last night".   (see " No Response").
- A response that includes spelling, *e.g.,* (basket)➔ "it begins with a <u>B</u>". (see "No Response").
- Single verbs, adjectives, and adverbs that have a phonological relationship to the target: (see "Formal Error").

Formal Error (F): A real word response that meets the criterion for Phonological Similarity to the target (see below under "Phonological Similarity").
> *e.g.,* (<u>snail</u>)➔ "mo<u>nster</u>", (gho<u>st</u>)➔ "<u>stop</u>", (<u>b</u>asket)➔ "<u>below</u>"

The Formal Error category excludes the following:
- Formal errors exclude <u>substitutions or additions</u> of morphemes in compound words, *e.g.,* (microscope)→ "telescope". (see " Semantic Error")

- Formal errors exclude morphological <u>omissions</u> in multi-morphemic targets (including compounds), *e.g.,* (ruler)→ "rule", (fireman)→ "fire". (see "Miscellaneous").

Fragment (f): A minimally CV (consonant-vowel) or VC response (schwa <u>not</u> counted as a vowel), which is abbreviated in that <u>either:</u>

- the attempt (partial or whole word) was self-interrupted (cut off)
  e.g., (cane) → "/kre-/" (where the dash "/…-/" indicates voicing was cut off)
     (seal)→"snail-" (the whole word is self-interrupted)
                            <u>or</u>
- a monosyllabic response was given to a multisyllabic target (3 or more syllables)
  e.g., (calendar) →"/kæl /" (a monosyllabic response to a multisyllabic target)
              (see exceptions under "Complete Attempt")
                            <u>or</u>
- an utterance with level intonation is followed immediately (i.e. without noticeable pause) by another attempt.

Note: You do not have to enter Fragments into the score-sheet to code them, but you must be able to identify them in order to bypass them in search of first Complete Attempt.

Miscellaneous: *Conventional Scoring* typically includes the following types of responses:
- **Blend:** A word or nonword response that is a blend of two synonyms to the target , or a blend of the target and an identifiable synonym: There must be close semantic association and phonological similarity:
  e.g., (pineapple)→ "/bənæpəl/"   (blend of banana and pineapple, or apple)
- **Morpheme Omission:** A response that is a morphological omission in a multi-morphemic target (including compounds):
  e.g., (ruler)→ "rule", (fireman)→ "fire"

- **Phonological Jargon:** *e.g.,* (dog)→ "he's down /rumən-æzər/ a /bɛs-kləf/"

- **Picture Part Error:** A word or nonword response that is a component of the depicted target:
  e.g., (bride)→ "veil" - where picture shows bride wearing a veil

- This category may also include **Phonologically Unrelated Nonwords** (see below under "Nonword"), i.e. a nonword response that fails to meet the criteria for Phonological Similarity: *e.g.,* (flashlight)→   "/mɚ-nɔk/"

- **Proper Nouns:** A proper noun that is unrelated to the target phonologically or semantically (see below for Proper Noun).

Mixed Error (M): A real word response that satisfies the criterion for Phonological Similarity (see "Phonological Similarity") <u>and</u> bears an obvious semantic relation to the target.

> *e.g.,* (hat)→"hood",   (strawberries) →"cherries"

> *Response types that <u>do not</u> meet the criteria for "Mixed Error":*
> - Mixed Errors exclude responses that result from <u>substitution or addition</u> of morphemes in compound words:
>   > *e.g.,* (microscope)→ "telescope". (see " Semantic Error")
>
> - Mixed Errors exclude responses that result from <u>omission</u> of morphemes in multi-morphemic targets (including compounds):
>   > *e.g.,* (ruler)→ "rule",   (cheerleaders)→"cheer" (see "Miscellaneous").

Nonword- Phonologically Related (N): A nonword response that meets the criterion for Phonological Similarity to the target. (see "Phonological Similarity")
> *e.g.,* (dinosaur)→ "/daI-nə-sɔrəs/"

Nonword- Phonologically Unrelated; (a.k.a. Abstruse Neologism -AN): A nonword response that does <u>not</u> meet the criterion for Phonological Similarity to target. (see "Phonological Similarity")
> *e.g.,* (apple) → /fugər/

In conventional coding, this may include responses that are phonologically related to a semantic relative of the target
> *e.g.,* (apple) → /bənunə/

No response (NR): Subject indicates verbally or non-verbally that s/he cannot name the picture. Also includes the spelling of words aloud, sound effects, and whispered responses.

> *e.g.,*   "I know it but I can't say it"
> (spider)→   "W-I-D-E-R"
> (owl)→   "hoot"
> (frog) →   "/rIbIt/

Perseveration (P): In conventional scoring, this is generally a second-order code, indicating that a response whose primary code is Semantic, Mixed, Formal, or Unrelated is one that was produced by the subject on a previous trial within the same session.

> *e.g.,*   (can)→ "cup" with a prior response of "cup":   M (P)

Phonological error: Any error, word or nonword, that meets the Phonological Similarity criterion;
> Includes: Phonologically Related Nonwords;   *e.g.,* (dinosaur)→ "/daI-nə-sɔrəs/"
> Formal errors;   *e.g.,* (snail)→ "mo<u>nst</u>er"

Phonological Similarity: Target and response share:
- the stressed vowel, initial or final phonemes;

e.g., (can)→"comb", (well)→"ball", (rope)→"hose", (tractor)→ "wagon" (share the /æ/),

(octopus)→"otter", (vest)→"jacket"
> or

- two or more phonemes (including stressed vowels but excluding unstressed vowels) at <u>any</u> position;
  e.g., (octopus)→ "spider" (share two phonemes - /s/ and /p/)
  > or

- one or more phonemes at a corresponding syllable <u>and</u> word positions, aligning words from left to right ;
  e.g., (seal)→ "dol-phin" (share the /l/)

  (ca-me-ra)→ "pho-to-graph" (/r/ at corresponding syllable position -onset of syllable- <u>and</u> corresponding word position -third syllable of target and response)

  (ther-mo-me-ter)→ "ca-mel"

  NOTE:
- Plural morphemes and schwa are not counted in determining Phonological Similarity.
- Consonant clusters are treated as a unit when determining syllable position. The following <u>do</u> have Phonological Similarity:
  e.g., (cane)→ "hand" (syllable position of /n/ corresponds as part of consonant cluster)
  (tractor)→ "rug" (share the initial /r/);
  (plant)→ "fern" (share the /n/);

  Fails test for Phonological Similarity:
  e.g., (type-wri-ter)→ "/'rɪŋ-kə/"
  (/r/ is at a corresponding syllable position -onset of syllable- but <u>not</u> corresponding word position- second syllable of target versus first syllable of response)

  e.g., (di-no-saur)→ "pos-sum"
  (/s/ is at corresponding syllable position -onset of syllable- but <u>not</u> corresponding word position when aligned left–to-right- third syllable of target versus second syllable of response)

  e.g., (map)→ "pin"
  (One sound is in common, but it is not in a corresponding position.)

Proper Nouns: Proper Noun responses that have a semantic relationship to the target are coded as Semantic, *e.g.,* (tractor)→ "John Deere"

Responses that have only a phonological response to the target are coded as Phonologically-Related Nonwords,
> *e.g.*, (dinosaur)→ "Dinah Shore"

Responses that are unrelated phonologically or semantically to the target are classified as Miscellaneous,
> *e.g.*, (book)→ "Canada"

Semantic Error (S): A real word noun response related to the target by one of the following:

synonym	*e.g.,*	(toilet)→ "commode"
category coordinate	*e.g.,*	(banana)→ "apple"
superordinate	*e.g.,*	(apple)→ "fruit"
subordinate	*e.g.,*	(flower)→ "rose"
associated	*e.g.,*	(bench)→ "park"
diminutives	*e.g.,*	(dog)→ " doggie"

- A related proper name that notes an association, *e.g.,* (star)→"Cowboys"

- The addition or substitution of a morpheme in a compound word:
  e.g., (microscope)→"telescope"

Unrelated Error (U): A word substitution that does not qualify as semantically or phonologically related to the target.

- Includes responses that bear a purely visual relation to the target: *e.g.*, (waterfall)→ "tie"

- Includes target unrelated responses that perseverate a response from a previous trial within the same session: *e.g.,* (ghost) → "book"

Visual Error: (see "Unrelated error" above)

Part II: Model scoring
http://langprod.cogsci.uiuc.edu/cgi-bin/webfit.cgi

For model scoring of the PNT using the online model-fit program, the following response codes are relevant:

1. Correct- See Part I
2. Semantic Error- See Part I
3. Formal Error- See Part I
4. Mixed Error- See Part I
5. Unrelated Error- See Part I
6. Nonword- Includes <u>both</u> phonologically-related and phonologically-unrelated nonwords, a.k.a. Abstruse Neologisms (defined in Part I)
   ****
7. Miscellaneous- As defined in Part I, except that phonologically-unrelated nonwords are not counted here, but instead are counted in the nonword category.
8. Non-naming responses (a.k.a. "Omissions")- comprises No Response and Description Errors, as defined in Part I, as well as Miscellaneous Errors, as defined above.

Note: When using the model-fitting program, enter counts for the first six categories only. In the default mode, these counts are automatically converted to proportions that sum to 1.0, thereby normalizing for non-naming responses (see inclusive no. 8 above) (for rationale, see Dell et al., 2004). The user should enter the total for the six categories in the cell marked "N" so that the model computes the appropriate Chi-Square value.

Part III: Two-level coding system for the PNT
(Roach et al., 1996)

A unique two-level coding system that differs from the conventional method of scoring was developed for the PNT. Most responses can be given a two-level code that allows for closer analysis and theoretical implications. A level 1 code classifies the response at a lexical level and a level 2 code classifies the response at a phonological level:

Level 1 codes (Lexical level):
1. Correct- See Part I
2. Target Attempt (TA)- a response that satisfies the criteria for phonological similarity (See Part I for phon.sim.) between the subject's response and the objective target. Target attempts must take a Level 2 code. Conventional scores for Formal errors, phonologically-related nonwords, and miscellaneous- morpheme omissions are captured here.
3. Semantic- See Part I
4. Mixed- See Part I
5. Other- unrelated verbal paraphasia; a one-word response (real word) that does not fit any of the other Level 1 codes; includes visual errors. Conventional scoring for these type errors is included in Unrelated errors in Part 1.
6. Blend- See Miscellaneous in Part I
7. Picture Part- See Miscellaneous in Part I
8. Perseveration- At Level 1 perseveration refers to the duplication of a response produced by the subject on any previous trial within the same session. Level 1 perseverations break down as follows:
   > (a) unambiguous perseverations - Enter "P" in the Level 1 column.
   > (b) one of multiple possibilities - Enter "(P)" next to the Level 1 code.
   > *e.g.* (can) - with prior response "cup":
   >   response "cup" is M (P)

   However, there is no O(P)

   superordinate description having generalized applicability is repeatedly given as the response (3 or more times), code this response as a description, not a perseveration.
   > *e.g.*, (strawberry, apple, banana)→ "fruit"
   > (Perseverations were included in Unrelated errors in Part I)

9. Description- See Part I
10. No Response- See Part I

Level 2 codes (Phonological level):
1. Sound error/word outcome (S/W):
   A Level 2 code indicating that the phonological structure of the response deviates from the Level 1 target and constitutes a real word; must be found in the dictionary; excludes proper nouns. To classify as a real word, the response must be listed in the Merriam Webster's Collegiate Dictionary; inflected forms of entries are also accepted as words.
   e.g. (corn) - cab

2. Sound error/nonword outcome (S/NW):
   A Level 2 code indicating that the phonological structure of the response deviates from the Level 1 target and does not constitute a real word; includes proper nouns that have no semantic relation; very obscure words, and derivational forms of words (e.g., "plower - one who plows; sipper" – one who sips).

   e.g. (ghost) - "/goθ/"

3. Morpheme omission (MO):
   A Level 2 code applicable to multi-morphemic targets (including compounds). Can only be used with target attempts;

   e.g.. (cheerleaders) - "cheer" (TA MO)
            (fireman) - "fire" (TA MO),

Application of Level 2 codes:
Level 1: Target Attempts must take a Level 2 code
Level 1: Semantic, Mixed, Picture Part may take a Level 2 code
Level 1: Other only takes a Level 2 code only if the response is a non-word (abstruse neologism)
Level 1: Blend or Perseveration can not take a Level 2 code