REPETITION AND PERSEVERATION SCALE (RPS)

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and the

Linguistic Error Scale (Perry et al, 1996)

Introduction and General scoring rules:

Stereotypy, perseveration, and repetition as indicators of cognitive inflexibility:

Cognitive inflexibility is often an indicator of neuropathology. Inflexibility can be characterized by assessing both the frequency and type of repetition in a Rorschach record. Severe forms of cognitive inflexibility, hallmarked by a high incidence of perseverations and stereotypy, are associated with neuropathology. Less severe forms of repetition occur in the protocols of non-patients who are anxious, fatigued or preoccupied with internally generated themes. In some cases both the more (perseveration) and less (repetition) severe form can occur simultaneously. In general, the presence of a high number of perseverations is indicative of an impaired cognitive process.

PERSEVERATIONS AND STEREOYPY

<u>Stereotypy</u> represents the most extreme form of inhibitory deficit. Stereotypies are scored for responses that are consecutive or near consecutive occurrences of the same exact prior response delivered in a reflexive fashion. They tend to be lacking in descriptive information and are usually one-word responses. There is often an apparent disregard for blot features, resulting in FQ-. The sequence of stereotyped responses are usually continuous but can be interrupted by up to two alternative responses in a chain of responses and still be scored as a stereotypy.

For example, Card I Bat, Card II Bat, Card III man, Card IV Bug, Card V Bat, and Card VI Bat etc.

In the above example responses to Cards II, V and VI are all scored as a Stereotypy.

Stereotypies are most closely captured by the Comprehensive System category *mechanical perseveration*. However, the CS scoring rules for mechanical perseveration do not score responses that are interrupted by a single alternative response.

Stereotypies occur infrequently, yet the presence of **a stereotyped response can be an important pathognomonic sign of neuropathology.**

Perseverations are repetitions that reflect an inability to disengage from prior responses, response elements, and response sets. Perseverations reflect both an ensuing difficulty with breaking away from one idea or theme and an inability to freely access new topics. Highly perseverative protocols are typically constricted; they contain a limited variety of themes and/ or descriptive phrases. Perseverations are often linked to pathological neurocognitive processes, specifically **a failure of inhibitory processes**.

Perseverations, however, are not always a sign of neuropathology. They occur with less frequency in some protocols of **normal non-patients and highly anxious individuals**. In these cases, the incidence of perseveration is usually low and the type of perseveration is of a semantic nature.

A perseveration response is not necessarily scored as an error. They can be appropriate to the blot (form quality ordinary/ no special scores/ Popular) or not. They are not scored when a word is repeated *within* a response for purposes of reiterating the percept or locating the blot area, i.e. "Two skeletons bowling, not really skeletons, but silhouettes of skeletons".

Perseverations can occur continuously or intermittently throughout the Rorschach protocol.

Three types of perseveration are scored. The process by which a response is repeated determines the type scored. In other words, it is **how** the content or response is repeated that indicates the type of perseveration. The categories of perseveration are differentiated by means of linguistic and executive processes involved in response production. Briefly, these categories are as follows:

Lexical Perseverations are repetitions of homonyms (words that are alike in sound and spelling but different in meaning across responses) and homophones (words that are pronounced the same, but have different meanings and perhaps different spellings – *air* and *heir* are examples). Further, a phoneme or root word may be repeated (*run*, *running*), or the response can contain a clang association ("*Mittens* on *kittens*"). The repeated element may be integrated into a new word with a **different** meaning. For example, responses such as/or "Two *bears*"… "A man *bearing* a rifle"…."A bug that is lost, it can't find its *bearings*" ….." a crest *bearing* the family name" are scored lexical perseverations.

Other examples include :
"An *apple*", "*Apple* cheeks", "*Apple* computer".

"Two *men* with their hearts in between them"; "A woman during *menses* "

A *face* covered with *lace*".

"*Blood*", "*Blood* oranges", "A massacre, *Bloody* Sunday"

"A *bat*", "A *battery*-operated candle"; "Two aliens holding a *battering* ram"

Semantic Perseveration is scored when a specific object or content is repeated and carries the same meaning across responses; e.g. "A flying *bat*"…"A Vampire *bat*"…"A Halloween *bat*". This type is scored only in the Free Association. This type of perseveration is usually

communicated through the use of the same word, i.e. "*Butterfly*"… "Another *butterfly*"…"Monarch *butterfly*", but may involve different words with the same meaning, "Horse"…"Equine".

Other examples include:

"A chimney making smoke"… "Smoke coming out of a factory"… "Cigarette smoke"

"Two bears"… "Polar bear in a snowstorm"… "Bears fighting".

"Skin of an animal"… "Animal hide"

Semantic perseverations can occur in normal non-patient protocols and are scored without regard for the appropriateness of the response. For example, a bat to Card I, bat to Card V still gets scored for semantic perseveration.

<u>Organizational Perseveration</u> is scored for the repetitive use of an explanatory phrase or problem-solving strategy. The phrase or strategy is expressed through words, as in the way that the subject explains, **justifies** or describes their percept, or in the way they locate or organize the blot. It is not the theme or the subject of the response that is perseverated, but rather phrases or words that **qualify, modify, justify or animate** the object of the response. Examples include:

"An animal that's been *kicked off* this mountain"… "A man; here he's *kicking off his shoes*"…"*Insects playing football, this one is kicking off to this one here*".

This type of perseveration commonly occurs in the Inquiry phase when the subject is asked to justify and explain their responses. They can be **scored in either the Free Association or Inquiry phase, but not more than once in the entire FA+Inq response.** The words used to modify the object may also be different and yet convey the same meaning, i.e. "a small man because he has *tiny* shoes"…"teddy bears because they're *itty-bitty*"…"two children because they're *miniscule*". The emphasis is on the way the response is organized and expressed through grammar.

Organizational perseverations often have an acoustic, prosodic, accentuation of rhythm that is noticeable, particularly when read aloud. Prosody is intonation (the rise and fall of pitch), variations in speech rate, and pausing. The prosodic rhythm may include the same words, in the same order, with the same number of syllables. For example, "A cat that's been dropped from a four story building"…"A cow that's fallen from a nine story building"…, "A man that has dropped from a large mountain".

Organizational perseveration can also be scored if the subject uses a stereotypic way of organizing the structural features of the blot without the use of language (i.e., a way of arranging the spatial characteristics or relative position of the percepts). For example, the subject might repeatedly point to the top of the blot in a stereotyped fashion. The examiner must note this type of structural arrangement; it is not derived or inferred from analysis of DQ areas or the location sheet.

Organizational perseveration is **not scored** for the repetitive use of descriptive phrases common to most Rorschach records (e.g., "looks like"; "because of the shape"; "because of the color" etc);

EXAMPLES:

"The *irregular lines* makes it look like an x-ray"; "The *irregular lines* gives it a frenetic look"; "'A man looking angry; the *irregular lines* around his face give it an angry look".

"Two bats *coming together*", "Two Christmas angels *coming together*".

"*Two legs* makes it look like an animal", "*Two legs* makes it look like a man", "People dancing, the *two legs* makes it look that way"

"*A bunch* of animals", "*A bunch* of people", "*A bunch* of flowers"

"An *oversized* hamster", "A *gigantic* butterfly", "An *enormous* head"

"Two guys *playing* football", "Two animals *playing* Football", "Two men *playing* patty cake"

There may be more than one type of perseveration present in a single response (e.g., semantic and phonemic); therefore each of the three types of perseverations can be scored for a single response. However, each type of perseveration can be scored only once per response regardless of whether there are multiple examples of a single type of perseveration (e.g., Card 1"A **bat** with **shoes**", Card 5 "A **bat** here are his **shoes**"; each response contains two perseverated semantic elements). Responses that contain more than one type of perseveration are thought to be more pathological than responses containing only one type of perseveration.

In situations where there are several types of perseveration within a single response, the scorer must determine if they represent independent processes. If they do not represent independent processes then only one of the types of perseveration is scored. For example, if the subject states to Card 1 "two people… their eyes give it an illusion of anger" and to Card 2 "two bears… their eyes give it an illusion of anger" the appropriate score would be organizational perseveration, even though eyes are also perseverated. In contrast, if the subject were to state to Card 1 "a bat making a dive-bomb", Card 3 "A butterfly making a dive-bomb", and Card 5 "A butterfly in the middle... it looks like its dive-bombing" then both semantic (butterfly, butterfly) and organizational (dive-bombing) would be scored.

Associative Repetitions are exemplars that are linked by specific superordinate categories. The superordinate category may be based upon either similar distinguishing form features, i.e. "Butterfly"… "Moth"… "Winged insect"… "Bird", or words that are linked together by a common semantic category, "Hammer"…"a screwdriver"…"nails and screws"…"two carpenters". They are also reflected in responses that revolve around a particular theme, such as "A man who has been murdered"…"A bloody crime scene"…"A drive-by shooting".

Associations are thought to reflect preoccupations, ruminations, or even obsessions. Associative repetitions are not necessarily indicative of neuropathology, but rather are **intrusive recurrences of themes**. These themes may be described in a variety of ways, including the use of different descriptors, contexts, and may vary in regard to the level of complexity. The determining process becomes less clear when associations co-occur with perseverations or stereotypies. To score associative repetition often requires inspection of the entire protocol. A first order association between the percepts must be clear (such as in the above example "bat, butterfly, bird, hawk, plane, glider") rather than a second or third order association (e.g., "pliers, plane, fork" = things made from metal).

Unlike stereotypy and perseverations, which are often provoked by elements in the blot, repetitions are often internally generated and reflect elements of the subject's internalized concerns.

Linguistic Error Scale

1. Semantic Paraphasia: Word substitution based upon the semantic properties of the intended word. The meaning of the word is clearly conveyed. For example, <u>tentacles</u> for antennae or "Here is a bat and it is hanging on a tree by its <u>hooks</u>."

2. Phonemic Paraphasia: Word substitution based upon the phonetic similarity to the intended word. It is clear what the meaning of the word conveys. For example, "That is a lung conflicted with cancer", or "that is that horse with the horn on top of its head, I think that it's called a <u>Capricorn.</u>"

3. Unrelated Paraphasia: The use of a real word that is completely unrelated to the subject. In the case of an unrelated paraphasia the meaning of the word is unclear. For example, "It's a bat that's its <u>architecture.</u>"

4. Neologistic Distortion: Extremely distorted non-word, i.e. "This is a crab and this is his <u>phrengle.</u>"

5. Word Finding/Circumlocution: Elaborated phrase used to describe a word that the subject cannot recall. For example, "The thing that Eskimos live in and it's made of ice" or "a thing that you wear on Halloween and it has holes for your eyes."

6. Super-ordinate Category: A phrase that meets either of the two following conditions:

1) It identifies parts without integrating into a whole,

2) It correctly describes the target word in terms of
its superordinate class without elaboration. This is similar to
circumlocution but in this case there is no attempt to produce
the specific target word. For example, "two ears and a nose",
"it's a claw thing", "an animal with big teeth that takes down
trees", or "An animal that has wings and flies."

7. Inappropriate or Stilted Speech: Responses that are awkwardly phrased and stilted sounding. Unlike the paraphasic errors, changing one single word does not clarify the meaning of the sentence. For example, "My attention was being put on the center line", "A twin pair of lips", "An ear facing forward", or "a marble-like filtration of the colors."

8. Confused and Fluid Speech: A string of words that appear to be unrelated and convey a lack of focus. For example, "A bunch of horses, tails and fire up in heaven and all people are filled in
Heaven and earth".

Linguistic errors can be conceptualized in three categories.

1) Paraphasic errors
2) Word finding difficulties
3) Formal thought disorder

Within each of the categories the errors represent an increase in the level of impairment.

Semantic paraphasias are observed in people who are anxious as well as sloppy in formulating their thinking. We found an increased number of semantic paraphasias in patients with DAT as well schizophrenia.

Phonemic paraphasia reflects an associative semantic problem but can also occur under states of stress and anxiety. Phonemic paraphasia infrequently occurs.

Unrelated paraphasia is the use of a real word that is completely unrelated to the subject. In the case of an unrelated paraphasia the meaning of the word is unclear. For example, "It's a bat that's its architecture.")   This occurs in thought disordered individuals and may reflect the interface between thought disorder and semantic deficits. We mostly observed this form of paraphasia in **schizophrenia and bipolar/manic** patients but have also observed this in the seriously **neurologically impaired**.

Neologisms occur in highly disturbed (neurological and neuropsychiatric) states and reflect the most extreme type of linguistic error.

These four variables can be translated to represent CS deviant verbalizations. Semantic and phonemic paraphasias reflect level 1 special scores and unrelated and neologisms reflect level 2 special scores.

Similarly, inappropriate or stilted speech reflects a degree thought slippage that occurs in great frequency among thought disordered patients but can occur in isolated responses among non-patients.

Confused and fluid speech only occurs in confusional states and in highly thought disordered people.

These variables can be translated to represent CS deviant responses with inappropriate or stilted speech reflecting a level 1 special score and confused and fluid speech reflecting a level 2 special score.

In the validation study the Discriminant Function Analysis correctly classified 90% of the DAT patients and 100% of the non-patients. The variables which loaded into the equation were

> 1) Thematic perseveration
> Unrelated paraphasia
> Stuck-in-set perseveration
> Word-finding Circumlocution

Discriminant Function Analysis for schizophrenia patients and non-patient comparison subjects:

	% Correct	CTL	SCHIZ
CTL	84	59	11
SCHIZ	81	16	68
Total	82.5	75	79

Good Human
Total perseveration
Total linguistic error
Poor Human
Inappropriate and Stilted speech

Percentage Means and S.D. for Non-patients, SPD patients and schizophrenia patients on Linguistic error scale

	Nonpatients n=71	SPD n=15	Schizophrenia n=84	p value
Semantic paraphasia	.03 (.04)	.02 (.03)	.03 (.05)	NS
Phonemic paraphasia	.00 (.01)	.01 (.02)	.01 (.03)	NS
Unrelated paraphasia	0 (0)	0 (0)	.01 (.02)	S>SPD+NC p<.01
Neologisms	.00 (.01)	0 (0)	.01 (.03)	S>SPD+NC p<.05

Circumlocution word finding	.00 (.02)	(.02) (.05)	.00 (.01)	NS
Superordinate Category	.03 (.04)	.05 (.12)	.04 (.09)	NS
Inappropriate and Stilted Speech	.01 (.02)	.04 (.05)	.02 (.03)	Schiz > NC p<.001
Confused and Fluid Speech	.00 (.00)	0 0	(.03) (.06)	S > NC+SPD p<.001
Linguistic Total	.09 (.08)	.13 (.11)	.20 (.15)	S>NC p<.001

	Non-patients	Schizophrenia patients
	Mean	Mean
Lexical	.01	.03
Thematic	.05	.08
Organizational	.03	.13
Associative	.05	.13
Total	.14	.30