

Parse & Screen (P&S): A Novel Organization Process for Detecting Episodes of Lucidity in Dementia



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The implementation of the Parse & Screen (P&S) process allows for expedited segmentation of longitudinal audiovisual data of individuals with dementia to detect potential episodes of lucidity (ELs) and continued data processing.

BACKGROUND

- Episodes of lucidity (ELs) are described as an unexpected return of abilities among individuals with advanced Alzheimer's disease and related dementias (AD/ADRD) ¹
- Due to the rare, unexplored nature of ELs, a clear definition for the phenomenon remains ambiguous and varied among caregivers, researchers, and the general public
- Video-observations of people living with AD/ADRD can advance research on this complex phenomenon, but the volume of data generated is large, presenting challenges for feasibility of data processing procedures ²

OBJECTIVE

- To describe the novel process of Parse & Screen (P&S), which expedites audiovisual data processing and includes careful screening for potential ELs by segmenting audiovisual data into codable and non-codable data

METHODS

- Participants in the study are people living with AD/ADRD and video recorded within the inpatient hospice care setting (30 minutes – 8-hour video observations in mornings and afternoons)
- After data collection, observations are advanced to the P&S process (Figure 1)
- Observations parsed into segments and classified to reflect the level of verbal and nonverbal behaviors of the participant (Figures 2 & 3)
- Each data classification is timestamped, and the total duration of the segments are generated (Figure 2)
- Data screened for potential lucid episodes (potential ELs), (when identified, segments are timestamped and flagged for review) (Figure 2)
- Summaries of each segment created, describing location, participant activity, other individuals present, and important notes regarding the participant (Figure 2)

RESULTS

- A study participant enrolls and is observed to have these ongoing profiles
- Verbalizations: no verbalizations, rare occasional laughter
 - Facial Expressions: Rarely smiles
 - Engagement: Tracks individuals with eye gaze
 - Mobility: Bedbound
 - Physical Ability: Minimal purpose driven movements
 - Feeding Ability: Full Assistance

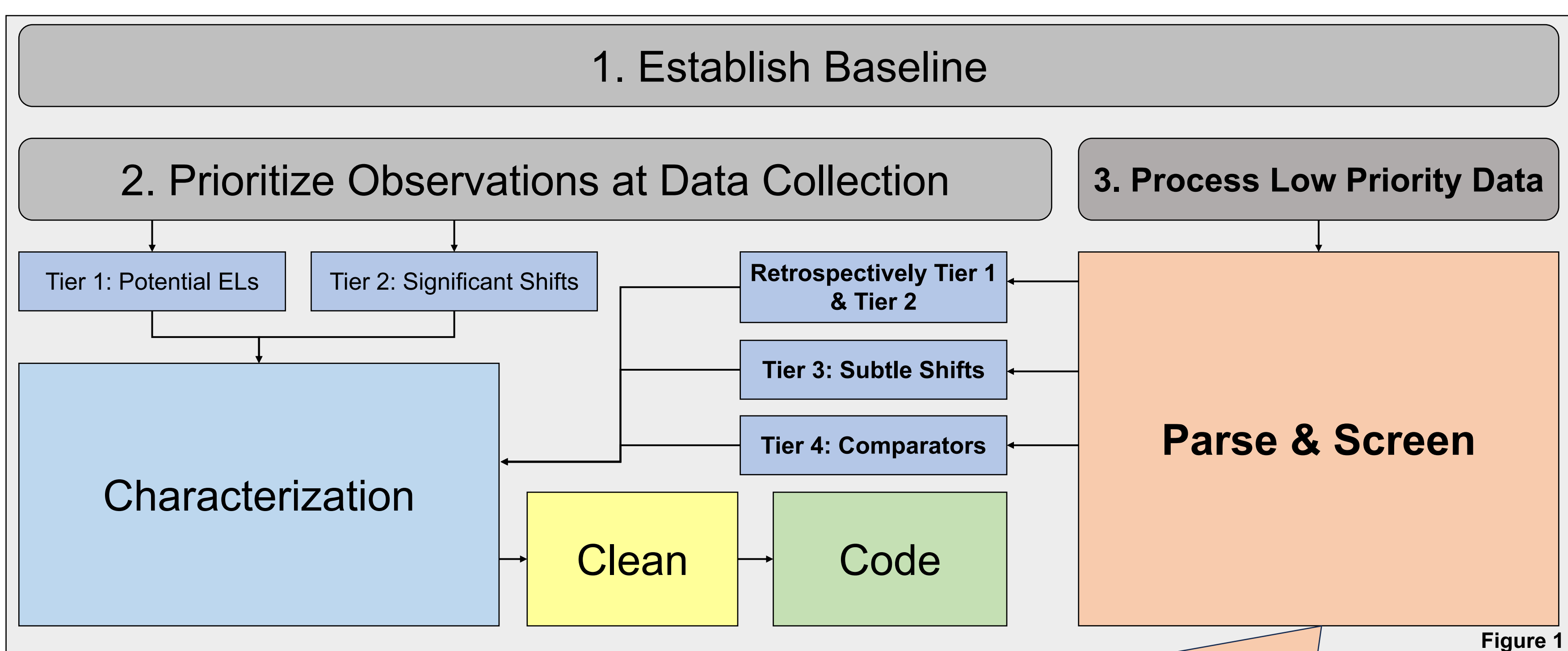


Figure 1

1:03:00-1:05:30 (0:02:30)	1:05:30-1:12:05 (0:11:35)	1:12:05-1:16:00 (0:03:55)	1:16:00-01:16:30 (0:00:30)	1:16:30-1:17:40 (0:01:10)
Codable	Negative	Codable	MS	Codable
Study participant resting in bed in room maintaining eye gaze at daughter. Daughter proceeds to direct participant's attention towards a family picture and asks questions, but participant exhibits no verbalizations.	Study participant resting in bed in room with eyes closed. Daughter present with study participant. Background stimulus: TV	Study participant resting in room with daughter present at bedside. Daughter talks to participant regarding family. Participant replies with a short, verbalized phrase, startling daughter.	Study participant resting in bed in room with eyes open. Daughter present with study participant. Background stimulus: TV	Study participant resting in room maintaining eye gaze at daughter. Daughter walks from bedside towards door. Participant tracks daughter's movement with eye gaze
<p>Potential EL (1:12:05-1:12:27): When the study participant's daughter tells participant, "I know dad's been gone for quite some time, but I still think about him all the time", participant responds with a short, verbalized phrase. Participant states, "Yes, I know", while maintaining eye gaze at daughter.</p>				

Figure 2

CODABLE	NON-CODABLE	
Codable A period of time during which the participant is mostly or intermittently alert and demonstrating verbal or nonverbal expressions that can be coded.	Minimal Stimulation (MS) The participant is awake and alert, but they are alone and demonstrating very few verbal or nonverbal expressions	Negative A period of time during which the participant (1) demonstrates limited or no substantiative acts or interactions, (2) is sleeping, and (3) is out of frame.

Figure 3

DISCUSSION

- P&S process successfully improves efficiency for identifying codable data for continued analysis
- Usage of data classification options help eliminate segments of observations that are classified as negative, indicating limited and non-engaging interactions between the participant and other stimuli in the environment
- Able to look closely into data segments classified as codable, as these segments are taken into further review to break down eye movement, verbalizations, gestures, active object manipulation, and initiatory behavior
- Variations of behavior and activities are present among individuals with AD/ADRD, leaving room for human error in the classification of data, given the large volume of data generated
- Implementation of a system to automatically classify data and accommodate for each participant's baselines may alleviate any confusion when classifying different participant observations

CONCLUSIONS

- P&S organization process allows visualization of baseline changes among each participant
- Due to the high volume and time-intensive processing of generated data, P&S process brings attention towards data segments that may indicate an EL, compared to a linear process identifying and coding for each particular activity of a participant all at once for each audiovisual observation
- Further research may look into the comparison of P&S to other similar observational tools with a similar objective

REFERENCES & ACKNOWLEDGEMENTS

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