A Comprehensive Conversational Dataset for Dementia Care: Integrating Expert-Designed Personas, Clinical Scenarios, and Episodic Discourse Analysis

Abstract

Dementia patient agitation significantly impacts clinical care quality and caregiver burden across healthcare settings. Despite advances in conversational AI for healthcare, research progress is severely limited by the absence of specialized dementia patient-caregiver conversation datasets that capture agitation progression and authentic communication dynamics. This research addresses this critical gap by developing the first comprehensive conversational dataset for dementia care interactions through three novel methodological innovations: (1) expert-designed medical personas capturing diverse patient characteristics and communication patterns, (2) clinically-validated agitation scenarios created by domain experts to ensure authentic care situations, and (3) episodic discourse analysis integration modeling dementia-specific linguistic patterns. We employ LLM-based generation enhanced with this tri-component framework, systematically combining detailed patient personas with realistic clinical scenarios while incorporating cognitive-linguistic principles including temporal reference confusion, narrative fragmentation, and pragmatic communication failures. The dataset incorporates emotion-labeled utterances and agitation trajectory modeling through dual validation: clinical authenticity assessed by domain experts, conversation quality evaluated by linguists. This interdisciplinary methodology creates a clinically-grounded, linguistically-sophisticated resource that enables breakthrough research in agitation detection, therapeutic communication modeling, and empathetic AI systems for dementia care, providing the first large-scale conversation corpus designed specifically for this vulnerable population.

1. Background and Motivation

1.1 The Critical Dataset Gap

Healthcare AI research for dementia care faces a fundamental obstacle: the complete absence of realistic patient-caregiver conversation datasets. Current limitations include:

- **No existing conversation corpora** for dementia patient-caregiver interactions
- **Lack of authentic patient personas** reflecting diverse dementia presentations
- **Absence of validated clinical scenarios** capturing real agitation situations
- **Missing linguistic sophistication** in modeling cognitive-communication changes

This gap prevents development of AI systems that can understand and respond to the complex, multi-turn nature of agitation progression in dementia care.

1.2 The Unique Challenge of Dementia Communication

Dementia patients exhibit specific communication patterns requiring specialized modeling:

- **Episodic memory disruption:** This leads to a loss of narrative coherence and difficulty with temporal references (e.g., confusing "yesterday" with events from years ago).
- **Pragmatic communication breakdowns:** During periods of emotional distress, individuals with dementia often experience failures in pragmatic communication, making it difficult to express needs and understand others.
- **Individual variation:** Communication patterns vary widely based on personal history, education level, disease progression, and cultural background.
- **Context-dependent agitation triggers:** Agitation is often triggered by specific environmental or internal cues, necessitating highly personalized intervention strategies

1.3 Research Significance

This dataset creation addresses multiple critical needs:

- **Clinical Practice**: Training data for AI systems supporting caregiver burden reduction
- **Research Foundation**: Enabling systematic study of dementia communication patterns
- **AI Development**: First linguistically-informed corpus for empathetic healthcare AI
- **Social Impact**: Supporting care quality improvement for 55+ million dementia patients globally

2. Research Objectives

2.1 Primary Objectives

1. **Develop expert-designed medical personas** with detailed patient characteristics, communication patterns, and agitation triggers reflecting diverse dementia presentations and backgrounds
2. **Create clinically-validated agitation scenarios** through domain expert collaboration, capturing authentic care situations and intervention challenges in real healthcare settings

3. **Integrate episodic discourse analysis** to model dementia-specific linguistic patterns including temporal confusion, narrative fragmentation, and pragmatic communication failures
4. **Generate comprehensive conversation dataset** using LLM-based synthesis enhanced with the tri-component framework of personas, scenarios, and linguistic principles
5. **Establish rigorous evaluation methodology** combining domain expert assessment of clinical authenticity with linguist evaluation of conversation quality and discourse accuracy

2.2 Future Extensions

- **Multimodal expansion**: Integration of prosodic features and speech synthesis
- **Cross-cultural validation**: Extension to diverse linguistic and cultural contexts
- **Longitudinal modeling**: Disease progression patterns over time

3. Methodological Innovation: The Three-Pillar Framework

3.1 Pillar 1: Expert-Designed Medical Personas

Innovation: Moving beyond generic patient profiles to detailed, clinically-authentic personas

Development Process:

- **Comprehensive patient characterization**: Demographics, medical history, personality traits, communication preferences
- **Dementia-specific features**: Cognitive level, speech patterns, agitation triggers, behavioral tendencies
- **Individual authenticity**: Personal background, education, cultural factors affecting communication

Example Persona Elements:

```
Norman (84 years old):
- Former Boeing engineer, moderate-to-severe dementia
- Communication: "Articulate but repetitive stories"
- Triggers: Wife-related concerns, unfamiliar environments
- Speech pattern: Technical language with increasing fragmentation
- Agitation response: Seeks authority figures, references work experience
```

Clinical Validation: Domain expert review ensuring realistic presentation patterns and intervention relevance

3.2 Pillar 2: Clinically-Validated Agitation Scenarios

Innovation: Expert-created scenarios based on real clinical experience rather than hypothetical situations

Development Process:

- **Expert knowledge capture**: Structured interviews with dementia care professionals
- **Scenario diversity**: Various settings (memory care, hospitals, home care), triggers, and intervention challenges
- **Progression modeling**: Realistic escalation and de-escalation patterns
- **Clinical authenticity**: Validation by practicing healthcare professionals

Example Scenario Framework:

```
"Home-seeking" Scenario:
- Trigger: Patient believes they're in wrong location
- Initial presentation: Polite confusion → growing distress → crisis behavior
- Environmental factors: Unfamiliar setting, time of day, staff changes
- Intervention opportunities: Reality validation vs. redirection strategies
- Resolution pathways: Multiple possible outcomes based on approach
```

Expert Validation: ~35 scenarios reviewed and refined by clinical professionals across different care settings

3.3 Pillar 3: Episodic Discourse Analysis Integration

Innovation: First systematic application of cognitive-linguistic theory to healthcare AI dataset creation

Theoretical Foundation:

- **Episodic memory disruption**: Impact on narrative coherence and temporal sequencing
- **Discourse marker analysis**: Linguistic indicators of cognitive changes
- **Pragmatic communication theory**: Speech act failures and conversational repair difficulties

Implementation Framework:

```
Cognitive-Linguistic Pattern Modeling:
```

```
- Temporal reference confusion: "Yesterday" for events years ago
- Narrative fragmentation: Incomplete stories, detail inconsistencies
- Memory consolidation failures: Repetitive initiation, episodic-semantic mixing
- Pragmatic breakdowns: Failed speech acts, conversational repair attempts
- Word-finding difficulties: Realistic hesitation and substitution patterns
```

LLM Integration: Systematic incorporation of discourse principles into conversation generation prompts

4. Data Generation Methodology

4.1 Systematic Combination Framework

Matrix Approach:

```
9 Medical Personas × ~35 Clinical Scenarios = ~315 Base Combinations
Persona-specific adaptations × Linguistic pattern variations = Scalable generation
Target: 1,000-2,000 high-quality conversation examples
```

Generation Process:

1. **Persona-Scenario Pairing**: Systematic matching considering clinical appropriateness
2. **Linguistic Pattern Integration**: Episodic discourse markers specific to persona characteristics
3. **Multi-turn Development**: 5-7 turn conversations with realistic progression patterns
4. **Quality Amplification**: Multiple variations per base combination

4.2 LLM-Enhanced Generation

Prompt Engineering Framework:

```
Template Structure:
Context: [Specific Persona] in [Clinical Scenario]
Discourse Requirements: [Episodic markers appropriate to dementia level]
Progression Pattern: [Agitation escalation/de-escalation trajectory]
Linguistic Constraints: [Communication style, vocabulary, coherence level]
```

```
Generate realistic conversation incorporating:
1. Persona-specific communication patterns
2. Scenario-appropriate agitation triggers
3. Dementia-level discourse characteristics
4. Therapeutic caregiver responses
```

4.3 Conversation Pattern Example

Gerald Scenario + Norman Persona Adaptation:

```
Turn 1 → Mild concern (2/10): "This doesn't look like my home office"
Turn 2 → Growing confusion (4/10): "I need to get to Boeing. They're expecting my report"
Turn 3 → Clear agitation (6/10): "You people don't understand! I have responsibilities!"
Turn 4 → Peak distress (7/10): "Where's... where's my briefcase? Margaret knows where..."
Turn 5 → De-escalation (5/10): "We worked on the 747... important project..."
Turn 6 → Calmed (3/10): "Margaret always organized my papers..."
```

Linguistic Features:

- **Persona-specific**: Professional references, technical background
- **Discourse patterns**: Authority-seeking, work-identity preservation
- **Episodic disruption**: Temporal confusion, role displacement

5. Evaluation Framework

5.1 Dual-Track Assessment

Clinical Authenticity Evaluation (Domain Experts):

- **Persona accuracy**: Realistic patient presentation and communication patterns
- **Scenario validity**: Authentic care situations and intervention challenges
- **Medical appropriateness**: Therapeutically sound caregiver responses
- **Progression realism**: Believable agitation escalation and de-escalation

Linguistic Quality Assessment (Linguists):

- **Discourse authenticity**: Accurate episodic memory disruption patterns
- **Conversation coherence**: Natural flow and turn-taking patterns

- **Cognitive-linguistic accuracy**: Appropriate dementia-level language characteristics
- **Pragmatic appropriateness**: Contextually suitable communication breakdowns

5.2 Evaluation Protocol

Expert Panel Composition:

- **Clinical experts**: 5-7 dementia care professionals
- **Linguistic experts**: 3-5 specialists in discourse analysis and cognitive linguistics

Assessment Methodology:

- **Multi-dimensional scoring**: Likert scales for authenticity, quality, and appropriateness
- **Agitation level validation**: Clinical scale mapping (10-point system based on established instruments)
- **Iterative refinement**: Expert feedback incorporation for dataset improvement
- **Statistical validation**: Inter-rater reliability and content validity measures

6. Expected Contributions and Impact

6.1 Methodological Innovations

Three-Pillar Framework:

- First systematic integration of expert personas, clinical scenarios, and linguistic analysis
- Novel interdisciplinary collaboration methodology between clinical and linguistic experts
- Scalable approach for generating clinically-authentic conversation data

Technical Advances:

- Comprehensive conversation corpus with sophisticated persona-scenario modeling
- Integration of cognitive-linguistic theory with healthcare AI applications
- Multi-turn agitation progression patterns for training empathetic AI systems

6.2 Clinical and Research Impact

Immediate Applications:

- Training foundation for agitation detection and therapeutic response systems
- Benchmark resource for evaluating healthcare conversational AI
- Educational tool for healthcare communication training

Broader Scientific Significance:

- First large-scale dementia conversation corpus enabling systematic research

- Foundation for studying cognitive-linguistic changes in dementia
- Framework for developing AI systems supporting vulnerable populations

6.3 Future Extensions

Multimodal Development:

- Speech synthesis integration with persona-specific voice characteristics
- Prosodic pattern analysis for early agitation detection
- Real-time monitoring capabilities for clinical applications

Scalability and Adaptation:

- Cross-cultural and multilingual extensions
- Integration with clinical decision support systems
- Longitudinal modeling of disease progression patterns

7. Conclusion

This research addresses a critical gap in healthcare AI by developing the first comprehensive conversation dataset specifically designed for dementia care through three novel methodological innovations. The systematic integration of expert-designed medical personas, clinically-validated scenarios, and episodic discourse analysis creates an unprecedented resource that captures the complex communication dynamics of patient agitation and caregiver interaction.

The tri-component framework establishes new standards for authenticity and linguistic sophistication in medical conversation modeling while providing a reproducible methodology for similar healthcare communication challenges. Through rigorous interdisciplinary collaboration between clinical experts and linguists, this work creates a foundation that enables breakthrough research in empathetic AI systems while supporting practical improvements in dementia care quality.

This foundational dataset represents a significant advancement toward AI-assisted healthcare communication that enhances rather than replaces human clinical judgment. By providing researchers and developers with clinically-grounded, linguistically-sophisticated training data, this work enables the development of AI systems that can meaningfully support caregivers in delivering compassionate, effective care to one of our most vulnerable populations.

The systematic methodology and validation framework established through this research will serve as a model for future healthcare AI dataset development, potentially transforming how we approach the intersection of clinical expertise, linguistic analysis, and artificial intelligence in healthcare applications.

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Project Proposal: A High-Fidelity Conversational Dataset for the Advancement of Empathetic AI in Dementia Care

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Abstract

Agitation in individuals with dementia is a significant clinical challenge, contributing to caregiver burnout, premature institutionalization, and reduced quality of life. While conversational AI presents a promising avenue for supportive intervention, its development is critically hindered by the absence of specialized, high-fidelity datasets that capture the nuanced, emotionally complex interactions of dementia care. This proposal outlines the systematic creation of the first large-scale, clinically-grounded conversational dataset specifically designed to model agitation and therapeutic communication in dementia. Our methodology is founded on a novel three-pillar framework: (1) **Clinically-Grounded Personas** representing the heterogeneity of dementia presentations; (2) **Expert-Validated Scenarios** mirroring real-world triggers for agitation; and (3) **Pragmatic Linguistic Modeling** to simulate the specific communicative patterns of dementia, such as anomia and narrative fragmentation. By systematically combining these pillars within a sophisticated LLM-based generation framework, we will produce a rich corpus of multi-turn dialogues. The dataset will undergo a rigorous dual-track validation protocol, assessed by both clinical experts for authenticity and linguists for conversational quality. This project will deliver a foundational resource for building and benchmarking the next generation of AI systems capable of agitation detection, empathetic engagement, and co-regulatory support for dementia care.

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1. Introduction and Background

The progression of dementia is often accompanied by behavioral and psychological symptoms (BPSD), with agitation being one of the most common and distressing. These episodes are frequently triggered by communication breakdowns, unmet needs, or feelings of confusion and loneliness. Caregivers are tasked with navigating these complex interactions, requiring immense patience and skill.

Conversational AI holds the potential to augment human care by providing continuous, patient, and personalized engagement. However, current AI models are trained on generic datasets that fail to capture the unique pragmatic and cognitive realities of dementia communication. This project directly addresses this critical resource gap. The absence of authentic data prevents the development of AI that can:

- Understand the subtext and emotional intent behind fragmented language.
- Recognize the early linguistic cues of rising agitation.

- Deploy clinically appropriate, non-confrontational de-escalation strategies.
- Personalize interaction based on an individual's unique history and triggers.

Our work is informed by principles from **pragmatics**, the branch of linguistics concerned with language in use and the contexts in which it is used. Individuals with dementia often experience a breakdown in pragmatic competence. Their communication should be understood not just by its literal semantic content, but by its intended function—often an expression of an underlying emotional or physical need. This project will create the first dataset that systematically models this pragmatic layer.

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2. Project Objectives

1. To develop a comprehensive set of nine clinically-grounded patient **personas** that encompass diverse cognitive levels, personality traits, backgrounds, and agitation triggers.
2. To create a robust library of **scenarios**, validated by dementia care experts, that depict common real-world situations leading to agitation.
3. To generate a large-scale conversational dataset (~2,000 dialogues) by systematically combining personas and scenarios within a structured AI generation framework.
4. To establish and execute a rigorous, dual-track **validation protocol** to ensure the dataset's clinical authenticity and linguistic quality.
5. To provide a foundational benchmark dataset to the research community to accelerate the development of empathetic AI for dementia care.

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3. Methodology

Our approach is built on a unique three-pillar framework designed to ensure the dataset's depth, authenticity, and relevance.

3.1. Pillar 1: Clinically-Grounded Personas

We will move beyond generic profiles to create nine detailed personas. Each persona is a rich character profile including demographic data, life history, profession, cognitive baseline, specific speech patterns (e.g., repetitiveness, anomia), and core emotional anchors (e.g., pride in career, love for a spouse).

3.2. Pillar 2: Expert-Validated Scenarios

In collaboration with dementia care professionals, we will curate a set of clinical scenarios that act as conversational prompts. These scenarios are based on common triggers for agitation, such as:

- Time/Place Confusion (e.g., sundowning)
- Misperceiving Objects or People
- Frustration with a Task
- Loneliness or a Need for Connection

3.3. Pillar 3: Annotation-Driven Prompt Engineering

The core of our generation process is a sophisticated prompt engineering framework. We do not simply ask a language model to create a conversation; we guide it at every turn using precise, clinically-informed annotations. Each caregiver's response is generated based on a specific therapeutic strategy (e.g., `[Strategy: Validation]`, `[Strategy: Redirection]`) that is passed to the language model as a direct instruction.

To illustrate this granular level of control, the following is the exact prompt structure used to generate a single caregiver turn in a dialogue with the "Norman" persona.

A) Base Scenario Template:

- **Patient:** Feels lonely and isolated.
- **Behavior:** Rings the call bell excessively to get attention.
- **Underlying Need:** Human connection and conversation.
- **Successful Intervention:** The caregiver engages the patient in a conversation about their life and identity, successfully de-escalating the behavior.

B) Persona Application:

- **Applied Persona:** "Norman" (84-year-old former engineer with moderate-to-severe dementia. Articulate but prone to repetition. Core emotional anchor is his late wife, Eleanor, and the house he built for her. Becomes agitated when his reality is directly contradicted).

C) Generated Conversation Sample:

Setting: Norman is alone in his room at the care facility. He feels isolated and begins ringing the call bell repeatedly.

- **Turn 1 (Caregiver):** (Enters the room calmly) "Hi Norman, I heard your bell. What's on your mind?"
    - `Annotation: [Strategy: Calm Entry, Open-ended Question]`
- **Turn 2 (Patient: Norman):** (Looks up, momentarily confused by the bell) "Oh, the bell? I'm not sure. But I'm glad you're here. I was just thinking... this room isn't right."
    - `Annotation: [State: Mildly Anxious, Need: Connection, Initial Behavior: Deflects from bell-ringing]`

- **Turn 3 (Caregiver):** "What's wrong with the room? You have your nice chair and the window with the garden view."
    - `Annotation: [Strategy: Reality Orientation]`
- **Turn 4 (Patient: Norman):** (Voice grows more insistent) "The wiring. It's all wrong. I'm an engineer, you know. I designed the house for Eleanor, and I need to make sure everything is perfect for her. She'll be home soon."
    - `Annotation: [State: Agitation Rising, Behavior: Connecting current anxiety to core life story]`
- **Turn 5 (Caregiver):** (Recognizes the core theme and shifts to validation) "You are an excellent engineer. The house you built for Eleanor is a testament to that. She must have been so proud. Tell me about the plans you drew up for it."
    - `Annotation: [Strategy: Validation of Identity & Redirection to Positive Memory]`
- **Turn 6 (Patient: Norman):** (The tension in his shoulders relaxes) "Oh, yes. I had a big desk right by the window. Eleanor would bring me coffee. The plans for the house... I spent a year on them before we even broke ground..."
    - `Annotation: [State: De-escalating, Behavior: Engaging in a comforting, repetitive story. The need for the bell is forgotten.]`

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3. Methodology

Our approach is built on a unique three-pillar framework designed to ensure the dataset's depth, authenticity, and clinical relevance. This methodology allows for the systematic generation of high-fidelity dialogues that accurately model dementia communication.

3.1. Pillar 1: Clinically-Grounded Personas

We will move beyond generic profiles to create nine detailed patient personas. Each persona is a rich character profile including demographic data, life history, and core emotional anchors. To ensure clinical precision, each persona will also be defined by a baseline score from **ASHA's Functional Communication Measures (FCMs)**. For example, a persona might be assigned an FCM Level 4 for "Memory" and Level 5 for "Spoken Language Expression," providing a standardized foundation for their communication patterns.

3.2. Pillar 2: Expert-Validated Scenarios

Pillar 2: Clinically-Validated Agitation Scenarios: *We will work with dementia care professionals to develop approximately 35 scenarios based on real clinical experiences. These scenarios will cover various settings (e.g., home care, memory care facilities) and model the realistic progression of agitation, from initial confusion to peak distress and de-escalation. An*

example is the "home-seeking" scenario, where a patient believes they are in the wrong location, leading to escalating distress.

3.3. Methodological Workflow: From Scenario to Annotated Dialogue

*Our data generation follows a systematic, multi-step process designed to ensure clinical relevance at every stage. We begin with two foundational elements—a **base scenario** and a detailed **persona**—and then employ an annotation-driven framework to generate a complete, high-fidelity dialogue.*

*The core of this process is **Annotation-Driven Prompt Engineering**. We do not simply ask a language model to create a conversation; we guide it at every turn using precise, clinically-informed annotations. Each caregiver's response is generated based on a specific therapeutic strategy (e.g., `[Strategy: Validation]`, `[Strategy: Redirection]`) that serves as a direct instruction to the model.*

The following example provides a transparent, step-by-step illustration of this entire workflow, from the initial setup to the final annotated conversation.

Workflow Example: "Norman"

***A) Base Scenario Template:** This workflow begins with a common clinical situation provided by our domain experts.*

- ***Patient Need:** Feels lonely and isolated.*
- ***Behavior:** Rings the call bell excessively to get attention.*
- ***Underlying Goal:** To initiate human connection and conversation.*
- ***Successful Intervention:** The caregiver engages the patient in a conversation about their life and identity, successfully de-escalating the attention-seeking behavior.*

***B) Persona Application:** Next, we apply a specific, detailed persona to the patient role in the scenario.*

- ***Applied Persona:** "Norman" (84-year-old former engineer with moderate-to-severe dementia. Articulate but prone to repetition. Core emotional anchor is his late wife, Eleanor, and the house he built for her. Becomes agitated when his reality is directly contradicted).*

***C) Generated Annotated Dialogue:** Finally, using our annotation-driven process, these elements are combined to generate a complete, multi-turn dialogue. Each turn is annotated to capture patient state, caregiver strategy, and conversational dynamics.*

- ***Setting:*** *Norman is alone in his room at the care facility. He feels isolated and begins ringing the call bell repeatedly.*
- ***Turn 1 (Caregiver):*** *(Enters the room calmly) "Hi Norman, I heard your bell. What's on your mind?"*
    - `Annotation: [Strategy: Calm Entry, Open-ended Question]`
- ***Turn 2 (Patient: Norman):*** *(Looks up, momentarily confused by the bell) "Oh, the bell? I'm not sure. But I'm glad you're here. I was just thinking... this room isn't right."*
    - `Annotation: [State: Mildly Anxious, Need: Connection, Behavior: Deflects from bell-ringing]`
- ***Turn 3 (Caregiver):*** *"What's wrong with the room? You have your nice chair and the window with the garden view."*
    - `Annotation: [Strategy: Reality Orientation]`
- ***Turn 4 (Patient: Norman):*** *(Voice grows more insistent) "The wiring. It's all wrong. I'm an engineer, you know. I designed the house for Eleanor, and I need to make sure everything is perfect for her. She'll be home soon."*
    - `Annotation: [State: Agitation Rising, Behavior: Connecting anxiety to core life story]`
- ***Turn 5 (Caregiver):*** *(Recognizes the core theme and shifts to validation) "You are an excellent engineer. The house you built for Eleanor is a testament to that. She must have been so proud. Tell me about the plans you drew up for it."*
    - `Annotation: [Strategy: Validation of Identity & Redirection to Positive Memory]`
- ***Turn 6 (Patient: Norman):*** *(The tension in his shoulders relaxes) "Oh, yes. I had a big desk right by the window. Eleanor would bring me coffee. The plans for the house... I spent a year on them before we even broke ground..."*
    - `Annotation: [State: De-escalating, Behavior: Engaging in comforting, repetitive story]`

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4. Validation Protocol and Quality Assurance

To ensure the dataset is a robust and reliable resource, we will implement a rigorous, multi-stage validation protocol anchored by both qualitative and quantitative measures.

4.1. Dual-Track Expert Review

Each generated conversation will be assessed by two independent groups of experts:

- **Linguistic Quality Panel (3-5 linguists):** This panel will assess the technical quality of the dialogue, including its conversational coherence, naturalness, and linguistic consistency with the assigned persona.

- **Clinical Validation Panel (5-7 dementia care professionals, including at least one Speech-Language Pathologist):** This panel will assess the clinical fidelity of the dialogues using two methods:
    1. **Qualitative Review:** Experts will provide an overall rating of the dialogue's realism and the appropriateness of the caregiver's strategy.
    2. **Quantitative Measurement using ASHA FCMs:** This is the core of our clinical validation. Experts will use ASHA's 7-point Functional Communication Measures to score the patient's performance within the dialogue. This provides an objective, standardized measure of quality.

4.2. Application of FCMs in Validation

The clinical panel will be asked to answer specific questions such as:

- "Does the patient's dialogue accurately portray the baseline **FCM Memory Level 3** assigned to their persona?"
- "On the 7-point scale, what is the patient's demonstrated FCM level for **Pragmatics** at the beginning of the interaction (during agitation) versus at the end?"

This pre- and post-intervention rating allows us to **quantify the effectiveness of the caregiver's strategy**. A successful interaction will show a measurable improvement in the patient's functional communication (e.g., moving from FCM Level 2 to Level 5 in Pragmatics within a single conversation).

4.3. Inter-Rater Reliability (IRR) and Iteration

We will calculate the inter-rater reliability (e.g., using Fleiss' Kappa) for all FCM scores to ensure our expert ratings are consistent and objective. Dialogues that receive low scores or show high disagreement among raters will be analyzed, and the feedback will be used to refine our data generation prompts. This iterative loop of generation, validation, and refinement is critical to achieving the highest level of quality for the final dataset.

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5. Expected Outcomes and Impact

This project will produce a first-of-its-kind resource: a large-scale, clinically-validated, and linguistically rich conversational dataset for dementia care. This will have a transformative impact on the field by:

- **Enabling New Research:** Providing the data necessary to train and benchmark novel AI models for agitation detection and empathetic response generation.
- **Improving Clinical Tools:** Serving as the foundation for AI-powered tools that can assist human caregivers, reduce burnout, and provide real-time support.
- **Advancing Personalized Care:** Facilitating the development of AI systems that can adapt their communication strategy to an individual's unique personality and history.

Further suggestions

ASHA's Functional Communication Measures (FCMs)

Adey

Amir

Saba

David

Jung-Ah

Chet

Jocelyn

Linguists:

Care-givers:

3 linguists without me

Pragmatics

Discourse analysis

Clinical linguistics or sociolinguistics

Clinical expert panel (a total of 10)

Nurses

Facility director/staff

Psychiatrist

Speech language pathologist

Synthetic data (conversation)

2,000

10~15% rating the data quality considering some criteria (inter-rater agreement)

1,800

10-15% of the data in the training session

Making rubrics

Inter-rater reliability

- Timeline (IRB, amount of work and time)
  - Compensation?
  - 200 (together), 180 conversations (each) -> 380 conversations
  -

Turns: 5-7 turns per conversation

Apprx. 2,000 conversations (thus, 10,000-14,000 turns… (lines?))

Clinical validation panel: their emotional intensity (arousal, valence,..etc.), situational relevance, etc…

Linguists: conversation quality (maxims, turn-taking, etc.)