



CARESSES  
Culturally-Aware Robots and  
Environmental Sensor Systems for Elderly  
Support



## Work Package 1: Transcultural Robotic Nursing

### Deliverable D1.3: Refined guidelines for cultural competence encoded in the cultural knowledge base

Lead Beneficiary: MU

Deliverable Leader: Irena Papadopoulou, MU

Contributors:  
Irena Papadopoulou, MU  
Christina Koulouglioti, MU  
Hiroko Kamide, NAGOYA  
Barbara Bruno, UNIGE  
Antonio Sgorbissa, UNIGE

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## Executive Summary

This Deliverable is the main output of Tasks 1.3 which entailed the refinement of the basic guidelines - produced in Task 1.2 - for cultural competence to be encoded in the cultural knowledge base (T 1.4). The refinement was achieved through expert evaluation of video clips recorded during an observation study which also included the collection of data through 'pen and paper' observations. Additional data for the refinement of the guidelines was gathered through an on-line user evaluation of mock up encounters of the robot with 'actor users' which were produced into short videos. The refinements resulted in additional guidelines and in some revisions of the existing guidelines. Relevant coding has also been implemented in the framework for cultural knowledge representation in Task 1.4.

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# 1 Description of the deliverable

According to the CARESSES DoA, Deliverable D1.3:

*is the main output of Task 1.3 and 1.4. It consists in a formal, machine processable, representation of the cultural knowledge acquired in WP1, using the software tools for knowledge representations that have been developed in WP2, in order to make such knowledge available as an input to the assistive system.*

CARESSES is an EU/Japanese collaboration which aims to design culturally competent robots for the care of older people. These robots will be able to adapt how they behave and speak to the culture, customs and manners of the person they assist. CARESSES' innovative approach will translate into care robots that are designed to be sensitive to the culture-specific needs and preferences of older clients, while offering them a safe, reliable and intuitive system, specifically designed to support active and healthy ageing and reduce caregiver burden. This is a three-year project with multiple objectives.

The first work package (WP1) of this project entitled 'Transcultural Robotic Nursing' is charged with the responsibility of developing detailed scenarios (Task 1.1) upon which the basic guidelines (Task 1.2) for the programming of a culturally competent robot are to rest. These two tasks which were completed during the first year of the project, were informed by the work of Hofstede (1991), Papadopoulos (2006), a literature review, and years of experience in nursing research and practice, as well as in robotics by members of the project team.

Deliverable D1.3 describes the work performed in Tasks 1.3 and 1.4, and includes this report, an ontology developed in OWL2 that includes all the cultural knowledge required for experiments in WP6 (which will be refined in the next months) and finally a software that allows for verbal interaction about the topics described in the ontology.

## **1.1 Iterative refinement through expert evaluation (Task 1.3)**

The iterative refinement of the basic guidelines through expert evaluation builds on the work we undertook in D1.1 (Detailed Scenarios) and D1.2 (Basic Guidelines). Deliverable D1.3 expands the theoretical underpinnings and testing the hypotheses and assumptions made in the previous two deliverables through an observation study and an evaluation of enacted video scenarios involving Pepper.

First, in order to verify the scenarios and guidelines we had produced and anchor them into real life, we conducted an observation study in the care homes owned by Advinia in UK, in one care home owned by Advinia's associates in UK, and in the HISUISUI facility in Japan (in a few cases we observed older people in their own homes). The observation study consisted of video snapshot recordings which were supplemented with concurrent 'pen and paper' observations of subtle everyday behaviours, responses to triggers, and verbal and non-verbal communications using specially designed tools.

Second, to strengthen the refinement of the guidelines even further, we also conducted an on-line evaluation using older people as evaluators. For this exercise we created mock up videos depicting the Pepper robot and actor-users enacting scenarios which mimicked real life situations in the UK, India, and Japan.

Section 2 of this document describes in detail the design of the observation study and the development of the tools we used to collect and analyse the data.

Section 3 describes the processes and procedures used during the observation study, the recruitment and training of the experts who conducted the analysis of the videoed observations, the profiles of the study participants, and the lists of videos that were analysed.

Section 4 presents the synthesis of the observational findings.

Section 5 describes the development of videoed encounters of the robot (Pepper) with actors enacting scenarios with older persons.

Section 6 provides a discussion on all findings, the researchers' reflections on the implementation of the work undertaken for the refinement of the basic guidelines as well as some conclusions and suggestions for the next steps.

## **1.2 Cultural competence encoded with formal tools (Task 1.4)**

Section 7 of this report requires that the reader is familiar with Deliverables D2.1 and D2.2 describing the Cultural Knowledge Base (CKB), and details how the guidelines have been encoded in it. It outlines how the OWL2 ontology has been built by UNIGE who also developed and delivered a training programme, a tutorial and a video tutorial, to enable the MU and NAGOYA teams to encode new knowledge sentences into the system. Section 7 concludes with a brief reflection of the experiences acquired during the encoding stage.

# **2 Observation Study**

## **2.1 Introduction and theoretical underpinnings. Visible And Hidden Culture, Triggers And Behavioural Responses**

All human beings are cultural beings. Culture is the shared way of life of a group of people that includes beliefs, values, ideas, language, communication, norms and visibly expressed forms such as customs, art, music, clothing, food, and etiquette. Culture influences individuals' lifestyles, personal identity and their relationship with others both within and outside their culture. Cultures are dynamic and ever changing as individuals are influenced by and influence their culture, by different degrees (Papadopoulos 2006).

This observation study is based on the theoretical ideas and empirical evidence related to the analogy of culture as an iceberg which was accredited to the American anthropologist E. Hall (1976). According to this analogy we can approach culture as an iceberg and think of certain elements that are visible (just like the tip of the iceberg) but imagine that many elements remain invisible and well hidden under the water level.

In everyday life the tip of the iceberg is what we can observe around us and during our interactions with others and we call that the visible and conscious part of culture. This part of culture can include visible behaviours such as body posture and gestures, greetings, facial expressions, eye contact and others such as language, tone of voice, religious and other customs and rituals, music, food, dress, and so on.

We call the rest of the iceberg, which is well hidden below the water surface, as the invisible subconscious part of the culture which relates to beliefs, values, feelings, roles, social rules, attitudes, perceptions and more (Figure 3). These hidden elements which reside in our subconsciousness, influence our behaviours, actions, reactions, and feelings. This subconscious part of culture is developed through the socialization process during childhood and evolves during adulthood based on our life experiences.

Hofstede (1991), after an extensive work on workplace values and culture, identified six main dimensions of national culture that distinguish countries (rather than individuals) from each other on certain independent preferences. These six dimensions are: a) individualism, b) power distance, c) masculinity, d) uncertainty avoidance, e) long term orientation and f) indulgence.

Notwithstanding the usefulness of the national indices produced by the Hofstede's cultural dimensions, and the consensus on certain universal values as expressed in human rights codes and legislation, Papadopoulos (2006) has argued that at a cultural/ethnic group level as well as at the individual level, cultural differences exist in terms of values, perceptions and attitudes and their manifestation in decisions taken about self-care practices, the status designated to rituals, routines and relationships, the reactions to and management of life course events and challenges, and so on.

Of relevance to our current study is the work of anthropologists Bossard and Boll (1950) who, more than 60 years ago concluded that rituals are powerful organizers of family life and found that family routines are observable, patterned interactions that are repeated over time (Boyce et al. 1983; Wolin and Bennett, 1984; Howe, 2002) but are not the same for every individual or family. In other words, we may all have a morning, an evening or a lunch routine but those routines (the things we do) will not be the same for each one of us. As a result, observing naturally occurring every day routines provides the ideal avenue of exploring culturally observable behaviours and their subtle differences among individuals from the same or different cultural background.

In addition, a significant body of literature has demonstrated that routines of daily living relate to an individuals' health and well-being (Fiese et al., 2002). For example, it has been found that young children living in disorganized home environments characterized by lack of routines (Gregory et al., 2005) or by increased noise levels, crowding, and family instability (Brown and Low, 2008), had an increased likelihood of experiencing sleep problems and were less likely to have regular sleep routines. Among healthy adults, eating regular breakfast has been associated with reduced dietary fat intake (Schlundt et al, 1992) and decrease prevalence of obesity (Ma, et al 2003). Predictable everyday routines are considered essential for preventing distress among patients with dementia or memory loss (Alzheimer's association, [agingcare.org](http://agingcare.org)).

We hypothesize that unexpected events that can disrupt a person's everyday routine can trigger subconscious responses reflecting one's culture which eventually surface to the consciousness as observable behaviours. As a result, we aim to observe individuals during their everyday routines and our goal is to capture observable behaviours (verbal and non-verbal), potential triggers which stimulate a subconscious response and the subsequent behaviours which surface from the hidden part of the cultural iceberg to the visible tip of the iceberg. We believe that such deep levels of understanding culture and cultural identity will assist in the development of guidelines for culturally competent robots.

## 2.2 Creation of the observation tools

In order to collect the type of data described in the previous section, we conducted an observation study which involved video recordings and manual recordings and field notes.

The following steps outline the work we undertook for the development of the two tools which were used in the observation study. We conducted

- **Step 1:** a Literature review to identify existing observational measures designed to capture observable elements of behaviour (verbal and non-verbal) as described in the tip of the iceberg. In addition, we drew on previous observational work conducted by Papadopoulos and Lay (2004).
- **Step 2:** a Literature review to identify measures that capture patient-health care professional communication
- **Step 3:** brainstorming for the development of observation templates and representation of the iceberg culture theory.

### 2.2.1 Step 1

Papadopoulos and Lay (2004) observed and coded mother-child interactions during play. They observed mothers from different ethnic backgrounds (mainly English and Bangladeshi) in a community setting and captured children's reactions and mother's involvement. The observation tool created for their project was used as a starting point for the development of the current tools (Tool 1 and Tool 2). We also conducted a literature review and identified an array of existing observational instruments but none directly related to our main goal. We found a few instruments that have been used to capture cultural differences among groups that focused on facial expressions and the exhibition of emotions such as:

- The Specific Affect Coding System (SPAFF), an observational measure designed to capture affective behaviour in the context of marital conflict (Coan and Gottman, 2007). The current codes of SPAFF of positive effects (affection, humour, etc) and negative effects (anger, sadness, disgust etc) have been influenced by the work of Ekman & Friesen on the Facial Action Coding System. The Facial Action Coding System (FACS; Ekman, Friesen, & Hager, 2002) captures facial expressions and researchers have used the instrument to observe cultural differences among people around the world (McDuff, Girard & Kalioudy).
- Another instrument that has been used to explore differences among Turkish and Dutch patients during their interactions with their GP is the Verona Coding Definitions of Emotional Sequence (VR-CoDES). This measure captures patient's emotional cues/concerns and GP's responses to these cues (Schouten and Schinkel, 2015).

### 2.2.2 Step 2

Subsequently we searched for instruments that have been used to capture and assess the nurse-patient interaction. Many such instruments exist such as the Caris-Verhallen, Timmermans, & van Dulmen, (2004). The Rotter Interaction Analysis System (RIAS) was used in the care of older people context, captures verbal and non-verbal communication. It was originally designed to code doctor-patient communication and uses verbal utterances (a small distinguishable speech segment that can be coded) as a unit of analysis (Roter & Hall, 1992).

In our study, we expanded the RIAS tool and the codes of verbal and non-verbal communication as defined by Caris-Varhallen et al (1999). The six non-verbal categories were: i) patient-directed gaze, ii) affirmative head nods, iii) smiling, iv) forward leaning, v) instrumental touch and vi) affective touch. We added the use of gestures and of personal space (see Tool 1 – for a 10 minute observation)

In regards to verbal communication we used the defined five categories related to socio-emotional and instrumental communication as described by Caris-Varhallen et al (1999) and in addition we captured: i) tone of voice, ii) taking turns in conversation, iii) silence, iv) use of humour and v) laughter. Furthermore, we tried to capture other elements which are related to one's culture but cannot be classified as part of communication. For example, we aimed at observing and coding the participants' use of language, their dressing and the presence or not of religious artefacts in their private environment.

In every 10-minute observation, Tool 1 is designed for coding the presence or absence of the behaviour, as well as frequency of each behaviour when present. Capturing the presence or absence of a behaviour is considered equally important from a cultural point of view. For example, the use of gestures may be very common for some but not necessarily for others and acknowledging these small but subtle differences are important in avoiding stereotypical assumptions. In addition, for some behaviours we aimed at capturing certain qualitative properties such as certain gestures which could be considered or viewed appropriate by some but inappropriate by others especially in certain circumstances and contexts.

We decided that on-site observations shall also be video recorded in order to have a visual record the subsequent coding and validation of the data.

### **2.2.3 Step 3**

During this stage, we had multiple brainstorming sessions discussing ways that we could capture the hidden/subconscious part of one's cultural iceberg. We first decided to define the components of this part of the iceberg and, as seen in Figures 2 and 3, a diagram was created that captures one's 1. Values, 2. Feelings, 3. Perceptions and 4. Attitudes.

Following our hypothesis that observable behaviours may surface from invisible/subconscious part of the culture iceberg when everyday routines are disrupted we created a table of possible triggers of such disruptions that can be positive or negative. Our goal was to observe and look for possible triggers that may occur during our observational visits and may influence our participant's behaviour. Tool 2 is designed to capture possible triggers and their reactions/responses to them, demonstrated as surfaced observable behaviours.

## **2.3 Development of Tools and how to use them**

### **2.3.1 Tool 1**

Tool 1 was designed to capture the visible elements of culture and general information and it consists of four main columns (A. General Information, B. Verbal communication, C. Non-Verbal Communication and D. Other Elements). Each one of these columns is sub-divided into a number of smaller columns. One page is expected to be collected for every one snap shot video observation which could last from 2 to 10 minutes.

The tool was accompanied by the following instructions.

### **A. General information**

Participant's (older adult) gender, heritage, religion, medical history and time lived in the UK. In addition, record if the encounter is between the older adult and an informal or formal caregiver, the time of the day that the observation occurs and whether the older adult is participating in an individual or a group activity. In subsequent observations of the same participant, please use the person's ID number.

### **B. Verbal communication**

A list of verbal behaviours is included in the second main column of the table. Detailed explanation for each behaviour is provided in the next section. For each behaviour, provide information about i) the presence or absence of the behaviour (in the +/- column); ii) the frequency (F) in number of times the behaviour occurred during the observation coded as 'none of the time' / 'some of the time' / 'most of the time', iii) qualitative elements/properties of the behaviour, such as 'soft' for the tone of voice, or 'traditional language' when another language is spoken other than English (Q), iv) the duration of the event (D).

### **C. Non -verbal communication**

Use a similar approach for the non-verbal behaviours. Coding presence/absence, frequency and qualitative elements.

### **D. Other Elements**

In this last column, provide information about the use of language (other than English), type of dressing and the presence of religious artefacts (e.g. statues, icons, cross, etc) using qualitative codes of T = traditional and NT = non-traditional. When another language, even words, are being used during the interaction that will be coded as 'T'(Traditional). If the participant of Indian heritage were wearing Indian clothes this was coded as 'T' (Traditional) or as 'NT'(non traditional) if she /he was wearing western clothes. Religious artefacts will be coded as 'T' Traditional and when they are not present as 'NT'.

The table has many empty boxes in order to capture and record behaviours that have not been listed but they may be observed.

**A detailed explanation of all codes related to Tool 1 can be found in Subsection 2.4.**

#### **2.3.2 Tool 2**

Tool 2 was designed to capture the triggers and the subsequent subconscious responses. If behaviours were exhibited which could be linked to values, feelings, perceptions and attitudes, the trigger which in the observer's view caused the behavioural response was circled. For example, if the participant was waiting for her/his food but there was a delay, that could be a trigger of a subconscious reaction, such as anger. Or if a participant received a pleasant a phone call that was considered a trigger for a happy feeling which was expressed with words or with laughter/smiling.

## 2.4 Detailed Explanation of Codes (as developed by Caris-Varhallen et al., 1999)

### 2.4.1 Capturing Non-Verbal communication

**a. Eye Contact:** is defined as parties are making eye contact. Original code from the published article: *Patient-directed gaze is defined as the nurse looking at the face of the patient.*

**b. Smiling:** is defined as an utterance of friendliness. Original code: *Smiling in this context is defined as an utterance of friendliness. Laughing out loud, on the other hand, in response to a joke is not considered as non-verbal communication; it is coded in the verbal part of the observation scheme.*

**c. Body posture: with a special focus on forward leaning.** Original code: *forward leaning is defined as a posture which involves bending towards or sitting closer to the patient when this is not necessary to carry out the nursing tasks. This position conveys involvement and a concentrated focus on the interaction partner.*

**d. Affective touch:** Original code: *is relatively spontaneous and affective, and not necessary for the completion of a task (e.g. putting the arm around a distress patient)*

**e. Instrumental touch:** Original code is *deliberate physical contact, which is necessary in performing the nursing task (e.g. dressing a wound)*

**f. Head nodding:** it could mean agreement but in some instances just acknowledgement, or attentiveness to the conversation and /or reinforcing the spoken word. The original code states: *Head nods are defined as nodding one or more times as a sign of attentiveness in conversation or as reinforcing the spoken word*

The following codes have been added by Papadopoulos and Koulouglioti, 2017:

**g. Use of gestures:** capturing the use of gestures when talking (e.g. moving hands)

**h. Personal space:** capturing the distance kept between the two parties for example to they sit closely together almost touching or in opposite chairs across the room having a conversation.

### 2.4.2 Capturing verbal communication

**a. Social communication:** Original code: *communication which provides information about the degree to which the nurse uses social conversation that has no particular function in nursing activities, such as personal statements, banter, jokes and small talk.*

**b. Affective communication:** Original code: *communication which provides information about the extent to which the nurse shows verbal attentiveness, concern, empathy and sympathy with the patient.*

**c. Communication that structures the encounter:** Original code: *communication which involves utterances that indicate guidance and direction such as orientating and instructing, requests for clarification, asking for understanding and asking for opinion.*

**d. Communication about nursing and health:** Original code: *communication which contains all items with respect to nursing, medical or therapeutic topics.*

**e. Communication about lifestyle and feeling:** Original code: *communication which contains all verbal expressions with respect to lifestyle issues and emotional topics.*

The following codes have been added by Papadopoulos and Koulouglioti, 2017:

**f. Tone of voice:** paying attention to the tone of voice and capturing whether it is loud, or soft. Other adjectives may be used so please keep a note.

**g. Taking turns in conversation:** parties are taking turns to express themselves and discuss by listening when the other person talks and waiting to respond as oppose talking over each other, simultaneously overlapping conversation.

**h. Silence:** keeping quiet.

**i. Use of humour:** saying a joke.

**j. Laughter:** Laughing out loud in response to a joke.

### 2.4.3 Other elements (developed by Papadopoulos and Koulouglioti, 2017)

**a. Use of language other than English:** Code as T = traditional when another language is used in the interaction or NT = non-traditional when the interaction is always in English.

**b. Type of dressing:** Code as T = traditional if wearing sari/salwar or NT = non-traditional when western clothes are worn.

**c. Religious ornaments and artefacts:** Code as T when religious ornaments are worn or religious artefacts (e.g. icons, scripts from the Koran, or Hindu statues) are present and NT when none is present.

### 2.4.4 Triggers (developed by Papadopoulos and Koulouglioti, 2017)

We define triggers the events that can trigger a response in the deep subconscious of a person which manifests as a visible behaviour which is unique to the individual's cultural values, perceptions, attitudes and feelings. In this study we have summarized such triggers in six main domains:

1. **Health and wellbeing:** Coded negative (-) such as not feeling well, when for example a person is experiencing pain or stress/anxiety and positive (+) when the person is feeling well, pain free, not anxious.

2. **Certainty/uncertainty:** Coded negative (-) when for example appointments are cancelled such as family visits, or absence of news from the family/significant others, or moving location, or a change of carer. The trigger is coded as positive (+) when certainty/continuity/predictability is maintained.

3. **Routines of daily living:** This is code as negative (-) when there is a disruption to the routine for example, meal not on time, caregiver is running late, outside appointments changed without much warning, and coded as positive (+) when there is stability and continuity in daily routines.

4. **Formal/informal caregiver's behaviour:** This trigger is coded as negative (-) when a late, unkind, rude or culturally insensitive response to a request is observed, and code as positive (+) when a timely, kind, culturally appropriate response is given.

5. A trigger **related to receiving news (personal or global):** This is coded as negative (-) when the person receives bad news about self and/or family or global/national news and coded as positive (+) when the person receives good news.

6. A trigger **related to finances:** Coded as negative (-) when the person is experiencing financial difficulties/strain and positive (+) when there are financial gains.

#### **2.4.5 Possible observable surfaced behaviours of subconscious/hidden cultural elements**

As described in the cultural iceberg the subconscious cultural elements and the behaviours associated with them can be related to 1. Values, 2. Feelings, 3. Perceptions and 4. Attitudes. Please refer to Figures 1 and 2.

### Tool 1 - Tool for a 10-minute observation

Participant's ID:

Date:

Name of care home facility:

Start Time:

End Time:

A. General Information		B. Verbal Communication				C. Non-Verbal Communication:					D. Other Elements	
Insert the information needed in this column below:		+/-	F	D	Q	+/-	F	D	Q		Q	
1. Gender: F / M 2. Age	Social					Eye Contact					Language	
	Affective					Smiling					Dressing	
3. Heritage: English / Indian	Instructions					Body posture					Religious artefacts	
4. Time lived in the UK (in years):	Talking about: a)Health/ Nursing					Affective touch						
	b)Lifestyle/ Feeling					Instrumental touch						
5. Type of encounter (routine): a. morning b. lunch time c. after lunch d. tea time 5. evening	Taking turns					Head nodding						
	Laughter					Use of gestures						
	Tone of voice					Personal space						
6. Religion:	Use of humour											
7. Carer: Formal /Informal	Silence											
8. Health status												
9. Activity a. individual b. group												

+ = present, - = absent, F = frequency (none of time/some/most of the time), D =duration Q = qualitative properties: INA = inappropriate, AP = appropriate, T = Traditional, NT = non traditional, S = soft, L = loud

Figure 1. Tool 1, designed to capture the visible elements of culture and general information

### Tool 2 – Triggers and Behavioural Responses

Participant’s ID:

Date:

Name of care home facility:

Start Time:

End Time:

Triggers (please circle all relevant present triggers)		Response to trigger (using the table below to capture all relevant codes as appropriate)		
Not feeling well	Feeling well			
Uncertainty	Certainty			
Disruption of routine	Predictability			
Late/unkind response	Timely/kind response			
Receive bad news	Receive good news			
Lack of Money (money troubles)	Money gains			
Codes for Behavioural Responses				
1. Values 1.1. Fairness/justice 1.2. Courage 1.3. Friendship 1.4. Dignity 1.5. Forgiveness 1.6. Compassion 1.7. Love	2. Feelings 2.1. Sadness 2.2. Anger 2.3. Fear 2.4. Despair 2.5. Happiness 2.6. Pain 2.7. Liking	3. Perceptions about 3.1. Self 3.2. Truth 3.3. Hostility 3.4. Physical health 3.5. Reality 3.6. Care received 3.7. Others	4. Attitudes 4.1. Age 4.1.1.Children 4.1.2. Death 4.1.3.Beauty 4.1.4 Older age 4.1.5 Roles 4.2. Gender 4.2.1.Roles 4.3. Work 4.3.1.Roles 4.4. Social status 4.4.1.Roles	4.5. Family 4.5.1. Motherhood 4.5.2. Childhood 4.5.3. Extended Family 4.6 Individuality/collectivist 4.6.1 Collaboration/competition 4.7 Hierarchy/Authority 4.8 Time/goal orientation

Figure 2. Tool 2, designed to capture the triggers and the subsequent subconscious responses

### Cultural Iceberg: Triggers and Reactions

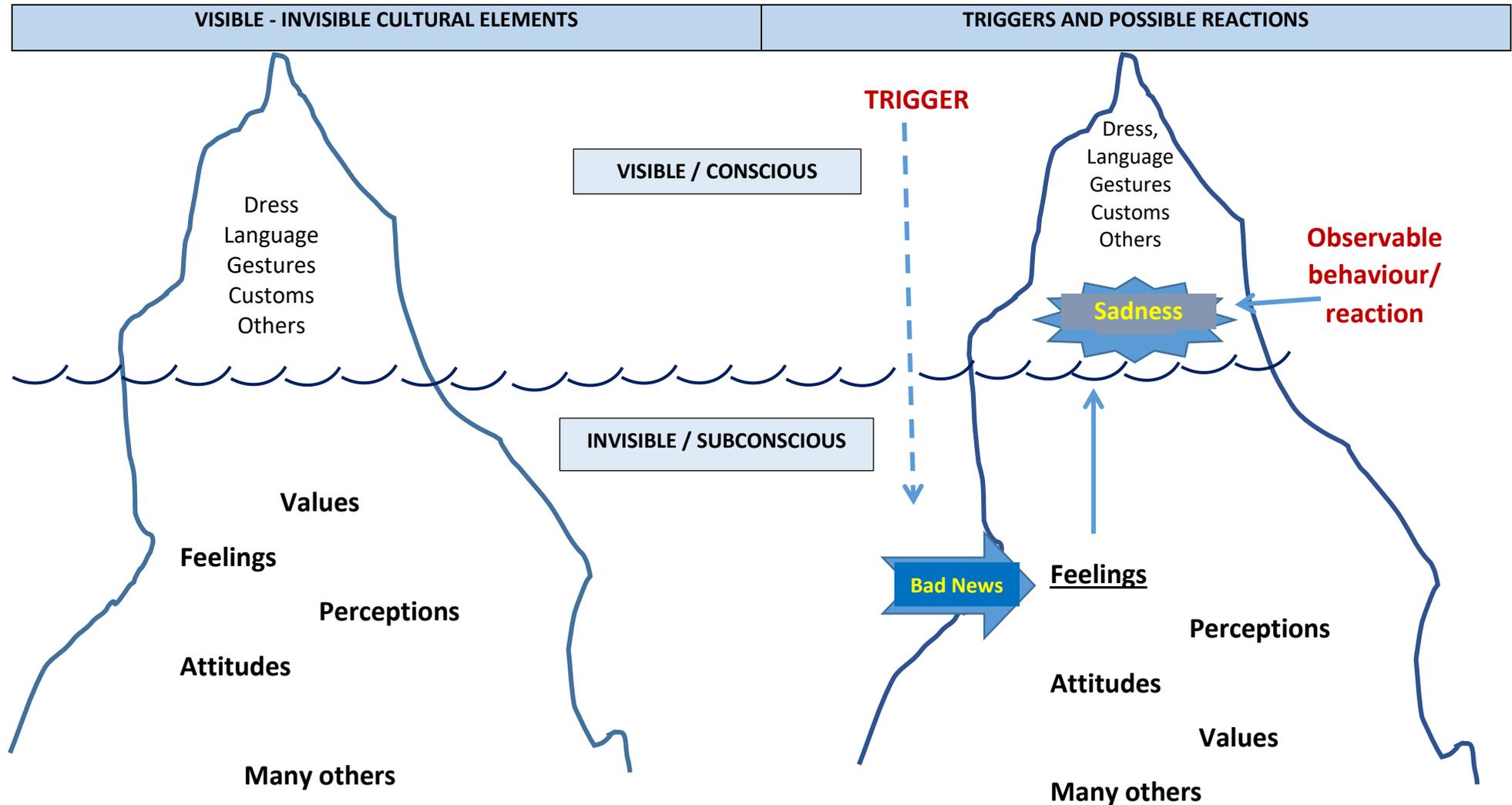
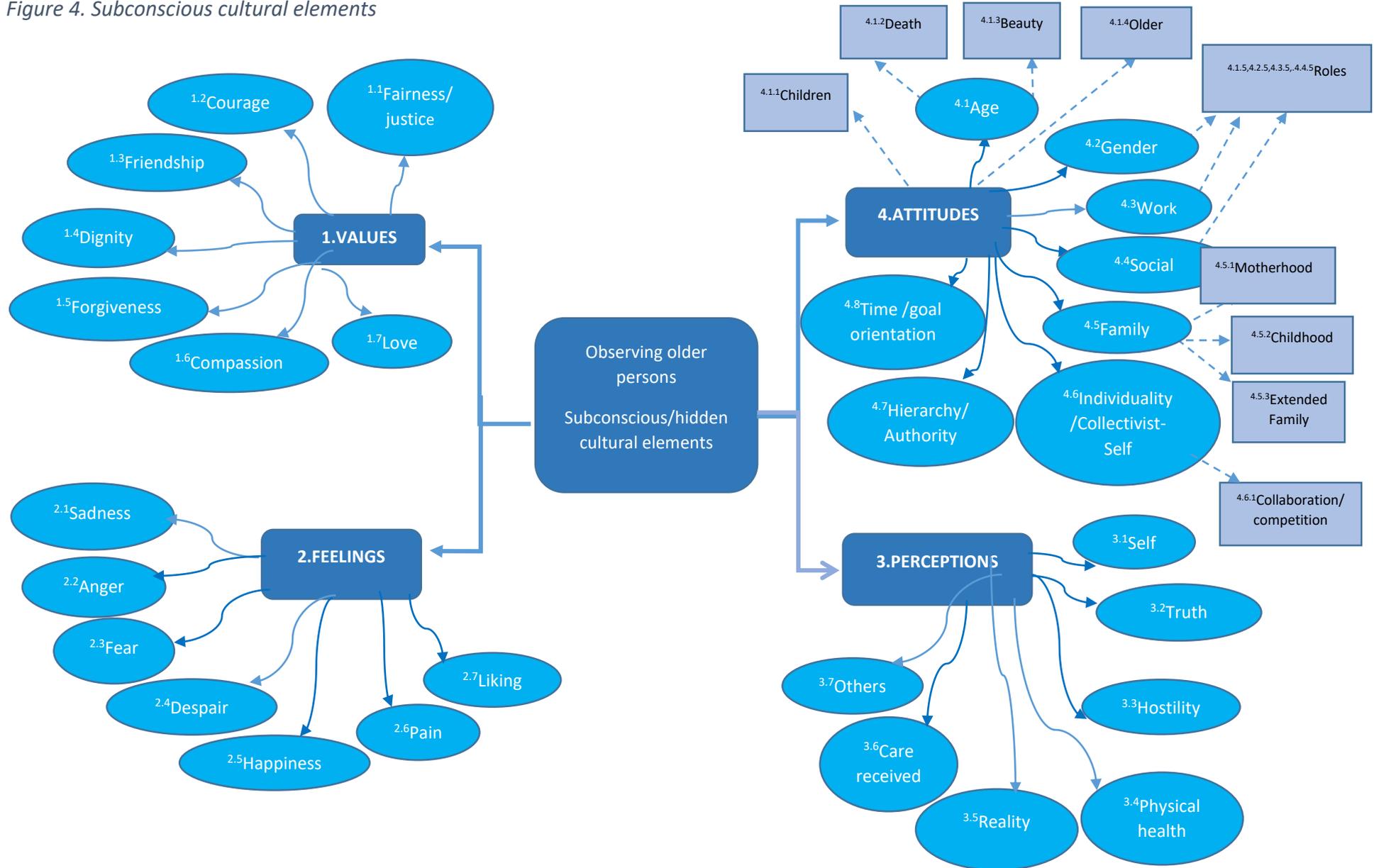


Figure 3. Observable behaviours may surface from invisible/subconscious part of the culture iceberg when everyday

Figure 4. Subconscious cultural elements



## 3 Observation Study

### 3.1 Introduction

As stated in the introduction of this document, the main objective of WP1 (Transcultural Robotic Nursing) is the development of guidelines for culturally competent assistive robots. This process started with the identification of cultural everyday scenarios. We focused on three cultures (white English, Indian and Japanese) and a series of scenarios, about everyday life of an older person from each of the cultural groups, have been written (see Deliverable D1.1).

In the UK, in order to verify the scenarios and anchor them into real life, snapshot video recordings of real older people living in care homes - and in a few cases in their own homes- were taken. These video recordings were supplemented with concurrent observations of subtle everyday behaviours, responses to triggers, and verbal and non-verbal communications. As explained in the previous Section, in order to capture the observations, we developed the two observational tools in sub-section 2.4.5 above (Tool 1 & 2).

In Japan a modified approach was used for the following reasons:

- The HISUISUI care home has different policies, that made it complex to perform the study in the same way; for example emphasis is given in collective activities which made observing individual residents in separate sessions difficult.
- In addition the available budget did not allow the Japanese team to follow the same processes at HISUISUI; as a consequence, manual ‘pen and paper’ observations by the researcher using tool 1 and tool 2 were not taken and video recordings were made over a continuous longer period rather than focused 10 minute sessions.

In the following paragraphs we will explain in detail the methodology of the study, how this was operationalised, leading to the list of the video clips that the **experts** viewed and analysed, by recording their analyses in the ‘**analysis tool**’ which we specially designed (Figure 5). We will then explain what was expected of the experts and why their help was critical.

### 3.2 Observational Study: Processes and procedures

#### 3.2.1 Objectives and design

Our main objectives during the observations were i) to capture snapshots from the everyday life of older adults living in assistive care facilities or their own homes in the UK and Japan and ii) to record supplementary ‘pen and paper’ observation data using tools designed specifically for this purpose (Tool 1 & 2).

The design of the study was descriptive qualitative and the main setting was the health care homes operated by Advinia Health Care (project partner). Advinia Health Care owns and operates multiple facilities around the UK and has many associates. In consultation with Advinia Health Care, we focused

on care home facilities where we were able to recruit older adults who could fit our inclusion criteria (see below).

The study was approved by the Middlesex University, ethics committee.

The design of the study in Japan was also descriptive qualitative and the main setting was the health care homes operated by HISUISUI, a collaborator in this project. In consultation with HISUISUI, we recorded videos of older adults who could fit our inclusion criteria.

The study was approved by JAIST, ethics committee.

### 3.2.2 Inclusion criteria

Older adults in who met the following **inclusion criteria** were recruited:

- a. being 50 years old and above,
- b. being of white English, Indian and Japanese heritage,
- c. being able to speak and communicate in English or Japanese and engage in conversation,
- d. being able to provide written consent and
- e. being relatively independent (able to do basic everyday activities).

Older adults who were unwell and unable to be interviewed due to poor health or due to cognitive problems (diagnosis of dementia) were **excluded**.

In Japan, JAIST signed a contract with HISUISUI, that recruited participants adhering to the same inclusion criteria. When the families of the older persons allowed their participation, the older residents became participants in the project.

### 3.2.3 Sample size

Twelve older adults (six of white English and 6 of Indian heritage) participated in the UK. Because the initial scenarios described the everyday life of an older woman we planned to mainly recruit women, during the Summer and Fall of 2017.

However, difficulties emerged in recruiting a sufficient number of women in the timeframe allocated. The decision was therefore made to recruit men as well, which was feasible because the activities in the initial scenarios were mostly gender-neutral.

The UK's final sample included 8 women and 4 men. In Japan, five elderly women participated in the project. The profiles of participants are described later in this document.

Having enrolled men as well as women turned out to be an advantage since the project reviewers recommended that we aim for gender balance during the first review meeting. The final sample, which was recruited before the meeting, is consistent with this recommendation as much as possible. In the UK, according to the Office for National Statistics, the resident care home population has around 2.8 women for each man aged 65 and over. In Japan, according to Ministry of Health, Labour and Welfare, the document of the status of users of nursing-care insurance facilities shows that, at the end of September 2016, 22.6% of the users are male and 77.4% are female.

### 3.2.4 Procedures

In the UK, we visited the chosen care homes at different times of the day to coincide with activities described in our scenarios which routinely take place during the morning, lunch-time, dinner-time, early evening. We anticipated that some family members would be visiting and interacting with their relatives, and staff members.

We minimised intrusion and disruption at the facility by being in constant communication with the managers and staff members of the facility. Before the initiation of the video recordings and observations, we obtained approval from the care home facilities and written informed consent from the residents and other individuals who agreed to take part in the project. We observed and video recorded only those older adults, their carers, and family member/s who consented.

Participants were told to do everything as they would normally do during the day. For example, during mealtime, they continue to serve dinner or lunch in the same place, with the same people and the same food as was usual for them. The videotaped snapshots lasted for a minimum of 2 minutes to a maximum length of 15 minutes. Researcher/s were always present during the observations and able to support all participants as needed (answer questions, stop the recording if needed, respect their privacy and always communicate with managers and staff in order to minimize disruption and intrusion).

In Japan, we constantly communicated with facility managers and staff, minimizing invasion and confusion of facilities. The facility took agreement from the family of the elderly, and recorded a video only for elderly people who got consent. We set up a schedule so that recording can be completed for at least 2 days per person, and ended recording over 6 days. A snapshot is about one hour for each scene. Researchers were always present during observation and were able to support all participants as needed.

### 3.2.5 Equipment

In UK we used a light weight, small camera, able to automatically adjust in light changes and record in low lighting. The camera was set up in a way so that we had in view the eating or sitting area, the older adult, caregiver or family member and able to capture gestures, positioning, expressions etc. Video recording started a few minutes in advance in order to ensure the correct operation of the camera. A flexible tripod was used for setting up the camera when possible. Flexible tripods (gripping, grabbing tripod perfect for SLR-type cameras and camcorders with bendable, fully rotating leg joints and maximum length 10 inches) provide the opportunity to be less intrusive and are helpful in minimizing reactivity to the video recording.

In Japan, we also shot with a lightweight and compact camera and a flexible tripod. On the screen of the camera, the angle of view was adjusted so that foods and sitting places, elderly people, carers, and families would fit and was set to capture gestures, positioning, facial expressions, and so on. In order to verify that the camera was working properly, video recording started a few minutes before the actual footage.

### 3.2.6 Data management

For each participant in the UK ‘pen and paper’ data were recorded.

Videotaped observations were downloaded to a password protected university computer. In UK recorded footage (10.7 hrs) was then edited and a list of different video clips (total of 39 clips; total length 4.15 hrs) was created (see section 3.7).

In Japan a total 40 clips were created (length 40 hrs). The clips were not edited and the whole footage for each participant was given to the experts for the analysis (see section 3.7). Although ‘pen and paper’ observations were not taken because of the different budget between UK and Japan, the researchers provided relevant data after completing Tool 1 & Tool 2 whilst viewing the videos.

### 3.3 Experts and their Role

The experts were recruited primarily based on their knowledge and understanding of the particular culture and not because of their professional background. They needed to know what is expected, what is appropriate, what is to be avoided, why certain words are used, the type of jokes, gestures, body language and so on, and what all these may indicate.

We requested from them to record on the ‘Analysis tool’ (Figure 5) the cultural expressions they observed while watching the video clips they were provided. Expressions may include visible evidence of culture (like the type of food the participants eat or the language they speak) but also other cultural cues which would not be so visible. **We were especially interested in the not so visible expressions of culture that can be easily missed.** For example, we may all feel frustrated when we have asked for something and we are waiting a long time for it, but we are not all expressing our frustration in the same way.

Our video footage depicted different everyday life moments. We asked the experts to observe our participants having lunch, or tea, playing games, just sitting with friends, exercising, dressing, talking or praying.

We explained during training that we needed them to look at a small selection of video clips and cast their ‘cultural eye’ especially **searching for subtle cues which provided cultural explanations of deep seated values, beliefs, attitudes, and so on, and how these influenced the behaviours of the person/s they were observing** (these notions were explained in Section 2, also see Figure 1).

Their input was viewed as important in helping us refine the guidelines we had developed for the robots by not missing critical cultural elements, not stereotyping, and be truly sensitive to the individual culture of the older person.

We asked the experts to watch only video clips of participants that matched their own cultural heritage. For example, the English heritage experts only watched videos of our English participants. In the UK we asked them to **watch a total of 9 video clips** (duration of 5-10 mins each) and complete one analysis tool for each one of them (see the Analysis Tool: Example, below). In Japan the whole video footage per participant was watched and analysed, for **a total of 40 video clips**.

### 3.4 Analysis Tool

The **analysis tool** we developed (Figure 5) was designed to capture visible and non-visible expressions of culture. To help the experts, we provided an example of how they should use the analysis tool. In the

**first column** we listed some visible representations of culture they may see while watching a clip. This list was not exhaustive, so we encouraged the experts to add to the list anything that they observed and it was specific to the English, Indian or Japanese culture. For example, a picture on the wall or something that the participant was wearing may have specific cultural meaning which the experts can add to the list in the first column.

The **second column** included examples of different expressions of values/feelings and behaviours. This list was also not exhaustive but provided useful examples of what the experts may identify while viewing the videos. The experts were asked to read the list, familiarise themselves with the items on it and think of the examples as they watched each video clip. If they thought that the participant was actually expressing any of the values/feelings or behaviours included in the list, they were asked to provide answers to the following three questions which appear at the top of the 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> columns. We have provided an example of what we meant in the first row of the tool (the participant's name is 'Mat').

The questions on top of the 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> columns are:

**Question 1: WHICH values/feelings/behaviours if any are expressed in this clip by the participant?**

**Question 2: Explain HOW these values/feelings/ behaviours are expressed by the participant?**

**Question 3: In your view WHAT caused or triggered the expression of these values / feelings / behaviours?**

### 3.4.1 Instructions to experts for the usage of the analysis tool

The experts were given the following instructions for the usage of the analysis tool:

- a. Step 1 Familiarize yourself with the analysis tool. Read the questions and example.
- b. Step 2 Please watch the video. You may wish to watch the video more than once. We have tried to focus the camera on the main participant (man or woman). Other people may be around or appear on the video but we need you to focus your attention on the reactions of the main participant.
- c. Step 3 Fill in the tool with what you see as explained above.
- d. Step 4 Review the next video clip on your list following steps 1, 2, 3.

**Step 1**  
Complete the 1<sup>st</sup> column

**Step 2**  
Read and think of the examples listed in the 2<sup>nd</sup> column

**ANALYSIS TOOL: EXAMPLE**

**Step 3**  
Think of what you see and try to answer the three questions

Title & Summary of Video Clip:

‘EnglishManAfternoonGames\_3mins. Mat is playing memory and word games with fellow residents in the garden.’

	Visible Presentations of Culture (Please tick all that apply)	Examples of Cultural expressions of values/feelings/behaviours	Q 1: WHICH values/feelings/behaviours if any are expressed in this clip by the participant?	Q 2: Explain HOW these values/feelings behaviours are expressed by the participant?.	Q 3: In your view WHAT caused or triggered the expression of these values/feelings/behaviours?
1	Language	Sadness	<i>I think Mat was being patient and respectful during the games</i>	<i>Taking turns, not interrupting, listening and making eye contact</i>	<i>Playing a game with a friend</i>
2	Dressing ✓	Happiness			
3	Music	Suffering			
4	Food	Distress			
5	Drinks	Annoyance/Anger			
6	Decorations (room)	Love			
7	Activities / games ✓	Compassion			
8	Jewellery	Friendship			
9	Festivals	Pain			
10	Customs	Courage			
11	Other? Please write	Dislike			
	<i>Games and questions relevant to English way of life</i>	Hostility			
		Trust			
		Fairness			
		Dignity			
		Self-Control			
		Contentment			
		Respect			
		Cooperation			
		Patience			
		Hope			
		Hopeless			
		Other:			

If you need more space please use the back of the page →

Figure 5. Analysis tool develop to help the experts to capture visible and non-visible expressions of culture.

### 3.5 Profiles of experts

- Expert 1 of English heritage. A retired lecturer and researcher of nursing, who specialised in transcultural nursing. She was born in London where she has lived for most of her life. She has travelled extensively and enjoys learning about other cultures.
- Expert 2 of English heritage. A retired lecturer of nursing with extensive experience in transcultural nursing. She continues to be involved in voluntary organisations focusing on transcultural nursing.
- Expert 1 of Indian heritage. A community Paediatrician, born and raised in India, currently living and working in the UK.
- Expert 2 of Indian heritage. A scientist, who was born and raised in India, currently living in the UK.
- Expert 1 of Japanese heritage. Born and raised in Japan, this expert is a qualified caregiver.
- Expert 2 of Japanese heritage. Born and raised in Japan, this expert qualified as an occupational therapist.

### 3.6 Profiles of participants

#### 3.6.1 English and Indian participants

In the UK a total of 12 older adults were recruited and observed - 6 of English Heritage: 4 women and 2 men and 6 of Indian Heritage: 4 women and 2 men. Following is a short description about each participant. In Japan total of 5 older adults were observed and all were women.

- **Profile 01.** Female, English heritage, 93-year-old, currently living in a nursing home (North West London), having mild forgetfulness issues. She worked as a nurse and she has one son. Her son works long hours and because she dislikes staying alone she decided to live in the nursing home.
- **Profile 02.** Male, English heritage, 79-year-old, currently living in a nursing home (North West London), suffering with age-related forgetfulness.
- **Profile 03.** Male, English heritage, 83-year-old, currently living in a nursing home (West London). He has a tracheotomy due to a cancer operation and therefore he whispers and likes to write. He is very lively, likes to joke, and he describes himself as a proper Englishman, going back to 1300s. His nickname is 'Foxy'; he likes to eat alone and to be helpful to the staff.
- **Profile 04.** Female, English heritage, 88-year-old, currently living in a nursing home (Essex). No major medical problems except for age-related forgetfulness. Very lively lady, who likes to joke and enjoys other people's company.
- **Profile 05.** Female, English heritage, 88-year-old, currently living in a nursing home (Essex). A very nice, polite lady who has arthritis and problems with her knees, requiring a walking aid. She has a daughter who lives close by and visits her often.
- **Profile 06.** Female, English heritage, 83-year-old, currently living in a nursing home (Essex). She has age-related forgetfulness and occasionally she was getting confused. Warm nature, she showed me her room and enjoyed spending time with the guinea pigs.

- **Profile 07.** Male, Indian heritage, Hindu, 65 years old, currently living in a care home (West London). A Hindu Indian gentleman, who immigrated to the UK from Kenya, Africa in his early 20s with his parents. He studied electronics, had a very good job, got married and had three daughters. His wife died from cancer in 1999, when his younger daughter was just 9 years old. He never remarried and raised his children alone. He is fluent in both English and Gujarati. Very polite and soft spoken. He likes to play chess, read and watch the news and watch TV. He had some blackout episodes and the family decided that it is best to stay in a protective environment.
- **Profile 08.** Female, Indian heritage, Hindu, 79 years old, currently living in a care home (West London). Immigrated from Africa to the UK in the 60s, with her husband (now 87 years old) with who she had a love-marriage. They were neighbours in Africa and know each other from childhood. She fell, had an operation and she is in the care home for rehabilitation but she is hoping to get better soon and return home. Very nice couple.
- **Profile 09.** Female, Indian heritage, Hindu, around 70 years old, currently living in a care home (West London). She is more fluent in Gujarati than English and she likes to be around people.
- **Profile 10.** Female, Indian heritage, Hindu, 73 years old, visiting her children and grandchildren in the UK (West Sussex). She is fluent in Bengali and English, she is suffering from retinitis pigmentosa and as a result she has very limited eye sight. She likes to socialize, watch TV and movies and talk with relatives and friends. Not very religious but traditional.
- **Profile 11.** Female, Indian heritage, Hindu, around 60 years old, visiting her children and grandchildren in the UK (West Sussex). She is fluent in Mahrati and English. She likes to cook and sing. Very religious.
- **Profile 12.** Male, Indian heritage, Hindu, around 65 years old, visiting his children and grandchildren in UK with his wife (West Sussex). He is fluent in Mahrati and English. He likes to volunteer, be active and try new things. Very religious and traditional.

### 3.6.2 Japanese participants

- **B.** 93 years old. There is confusion in the content and time series of her conversation. However, her short term memory ability is generally good. Her personality is sociable. She is strict with social rules, for example, often complaining that "a new room-mate does not greet in the morning." She never withdraws what she has made a decision. She takes the initiative in talking about the war era, and always participates in recreation. She positively greets as a representative in front of everyone. She is interested in fashion, and for clothes she does not like, she refuses it saying that "I can never wear such terrible clothes." She prefers relatively gaudy coloured clothes. She says she wants to live until 100 years old. She needs partial assistance in daily life, but for the most part she can take care of herself. She has a strong feeling that "I can do it myself" than being realistic about her actual physical ability. Therefore, although she always understands the need for staff to help her, when the staff is not nearby, she will not be able to wait until the staff comes and she will try to walk alone.
- **C.** 88 years old, She suffered from a compression fracture of the thoracic vertebrae, and now the pain is relieved, and she tends to improve the ability to lead daily life in general. She can communicate, but she has severe disability in short-term memory. She has a serious problem with her ability to recognize the situation she is in. She always keeps her bag in her hand, with notes and pencils in the bag. She writes down what she thinks in her notebook. For example, in the note, there is a description such as "I want to go home," "I had my money stolen". She has

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a desire to return home and a delusion of stolen things, but she only writes them on the notebook, and never tells them to staff. She can understand why she entered the facility or the situation on the spot, but she quickly forgets about them. Her personality is sociable and she likes to take care of others. She takes care of others who are more obstinate than her, calling them gently and stroking their back reassuringly. She has few failures in her daily activities, such as changing clothes and excretion, so she does not need assistance for her own personal things. She does not actively participate in recreation, but if staff encourages participation, she will participate.

- **D.** 87 years old. She has severe disability in short-term memory. She has entered the facility a long time ago but she thinks she is coming from home every day and she is working on a rice field with a horse. She cannot remember things a few seconds ago, but she is prideful enough that she does not say that she never remembers. She says that she was always careful not to sunburn while working on a rice field. When the staff tells her, "You are beautiful with your skin being white," she gets a very good mood. She always cares about the appearance of her eyebrows, and she always makes up her eyebrows. She never washes her brows when bathing. She has her face facing up so that hot water does not hit her face. Her personality is sociable, she takes the initiative to greet others. If someone else does not give her a greeting, she is offended saying, "That person does not say hello, though I am greeting." She actively participates in recreation and reproaches other users who do not try recreation much. She says, "Everyone is doing their best and participating, why do not they do well?" She actively participates in recreation that moves her body, but in the case of a quiz game where she does not understand, her expression becomes stern and she does not actively participate in such games. Even when a volunteer group comes to the facility, she enthusiastically claps hands and raise the field. For those who are sleeping, she is angry saying "It is rude". Walking in a short distance is possible for her. Because of the confusion of the behavior that she does not know the order of changing clothes, the staff needs to give instructions to confirm, but an instruction not to hurt her self esteem is necessary.
- **E.** 73 years old. She has no decline in cognitive function. She has aphasia due to cerebral infarction after effect, her speech is ambiguous. She can speak clearly about the limited word, but she uses gestures to manage communications. She communicates with staff well, but she does not have much involvement with other residents. She sits on her seat and spends time copying kanji (Chinese characters) drills and newspapers. She participates in recreation, but she never enters the circle of everyone else, and she joins in a place that is a bit far away. When she requests something to the staff, she can not wait for the staff and continues to say "Excuse me" repeatedly loudly. She tends to call until the staff respond, if there are something not prepared when she wants them even though they will be prepared before meals eventually. For example, faster meal delivery, a wet towel, a trash can, and so on. She is paralyzed with her right shoulder but walking with a cane is possible.
- **F.** 93 years old. She lived with her eldest son and his family, but she fell down at home and, broke a bone and was hospitalized. She became difficult at home and she entered the facility. She usually uses a wheelchair. It is possible for her to move using a wheelchair without being pushed by the staff if it is a short distance. She also carries out rehabilitation and also walks with a walker. She needs assistance because her standing and transferring is unstable. If she gets a handrail, she can hold her stance somehow, but it is also unstable. She can eat by herself. She has a strong appetite. She goes out with her family from time to time and eats out. She talks "I ate sushi." She says that she recently ate curry and rice. She was talking about wanting to eat roll sushi. She frequently talks about working for about 40 years at Noh theater. She has taken

care of the teacher, tea serving, cleaning and so on. She talks that she bought clothing often at Yamato in Kanazawa at that time. She still uses the clothes she purchased at the time, and when the staff say, "You are wearing nice clothes," she says, "I bought this clothes in Yamato a long time ago, I am embarrassed with clothes being old," but she looks so happy. She seems to be very clever and beautiful inside the house. Her son's daughter-in-law said, "Mother-in-law is tough, I also had a hard time." She also says, "She is a strong person." She always puts her face with milky lotion after bathing and puts a camellia oil on her hair. She does not severely contact other elderly people and staff and is calm. She never talks to other people actively, but as soon as others talk to her she responds with a smile every time. She often sleeps on the chair at the table, but she refuses to take a nap in bed, saying "This is enough to sleep at night." She is slowly at her own pace, but she is partially impatient if there is something she want to do. Therefore, she does not ask the staff for assistance but stood up alone from a wheelchair and once fell down. She has a life pattern that she finishes eating, then does teeth brushing and goes to the bathroom, and she tends to be unable to break the pace. She is sometimes not able to wait for assistance from a caregiver, and she is acting though she drives her own wheelchair herself. She often takes care of people, and after having bowel movements in her diaper or having anxiety about faeces, she refuses to stay in the tub. She ambitiously participates in daily routine gymnastics and recreation.

*Table 1 Titles of English and Indian video clips and summaries*

	<b>Title</b>	<b>Short Summary</b>
1	EnglishManLunchTime1_13mins	English man who has a tracheostomy and can only whisper, having lunch in the dining hall.
2	EnglishManBreakfastTime1_10mins	English man with a tracheostomy having breakfast in the dining hall.
3	IndianLady&GenMidMornringExercise_4 mins	Doing morning exercise in the temple with dandiyas (wooden sticks) due to the festival of Navaratri.
4	IndianLady&GenMidMorningExercise2_4 mins	Doing morning exercise in the temple with dandiyas (wooden sticks) due to the festival of Navaratri.
5	IndianLadyAfternoon_5mins	Indian lady sitting at the main entrance hall with fellow resident.
6	IndianLadyDressing_4mins	Indian lady putting on sari
7	IndianLadyDressing2_7mins	Indian lady putting on make-up/bindi etc
8	IndianLadyMealtime1_7mins	Indian lady 1 having lunch at the dining hall.
9	IndianLadyMealtime3_7mins	Indian lady 2 having lunch at the dining hall.
10	IndianLadyMidMorning_5mins	Indian lady spending time in the main entrance of the facility.
11	IndianLadyTemple_4mins	Indian Lady participating in the festival of Navaratri in Hindu Temple
12	IndianManAfternoonGameofChess_4mins	Indian man playing a game of chess with formal carer.
13	IndianManAfternoonTalking_7mins	Indian man sharing his thoughts with interviewer.

14	IndianManMealtime2_11mins	Indian man having lunch at the dining hall.
15	IndianManMorningExercise_10mins	Indian man doing 'chair aerobics' with other residents in the sitting room.
16	EnglishLadySong_2mins	English lady dancing to a song.
17	EnglishLadiesAfternoonActivities1_10mins	English ladies participating in afternoon activities: talking about TV shows, or listening to a song, or telling jokes.
18	EnglishLadiesAfternoonActivities2_4mins	English ladies participating in afternoon activities: talking about TV shows, or listening to a song, or telling jokes.
19	EnglishLadiesAfternoonActivities3_8mins	English ladies participating in afternoon activities: talking about TV shows, or listening to a song, or telling jokes.
20	EnglishLadiesAfternoonTea_3mins	English ladies having tea after playing afternoon games.
21	EnglishLadyAfternoonGames_4mins	English lady playing word games with fellow residents in the garden.
22	EnglishLadyLunch_4mins	English woman having her lunch.
23	EnglishLadyMealtime_11mins	English woman, waiting for her lunch and having lunch.
24	EnglishLadyMidMorning_15mins	English woman sitting at the conservatory, waiting for tea.
25	EnglishLadywithPet_5mins	English woman holding a guinea pig and taking with formal carer.
26	EnglishManAfternoonGames_3mins	Playing a 'reminiscence' game in the garden.
27	IndianCouple1_12mins	Husband and wife talking about their life
28	IndianCouple2_6mins	Husband and wife talking about their life
29	IndianCouple3_2mins	Husband and wife talking about their life
30	IndianCoupleMeditation_7mins	Husband and wife explaining their way of meditating.
31	EnglishLadyAfternoonGames_4mins	Playing i-spy word/observation games in the garden
32	EnglishLadyWatchingTV_3mins	Watching TV after lunch in the common sitting room
33	EnglishManAfternoonExercise_4mins	Playing 'hit the target' with fellow residents in the sitting room
34	EnglishMan&WomanGameofBingo_3mins	English Man and Woman participating in an afternoon game of Bingo.
35	EnglishManExercise_3mins	English Man doing hand and leg exercises after taking his afternoon tea and while sitting in the home's sitting area.
36	EnglishManExercise2_7mins	English Man participating in a ball game.
37	EnglishManTea_5mins	Taking tea early afternoon
38	IndianCoupleMakingPrasad_8mins	Husband and wife preparing 'prasad' - a sweet. Prasad is prepared and offered during praying.

39	IndianCouplePuja_14mins	Husband and wide doing puja-longer prayer (cleaning and offering sweets and flowers to Hindu gods)
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*Table 2 Titles of Japanese video clips and summaries*

1	B breakfast 1: 43mins	Eating breakfast
2	B breakfast 2: 30mins	Eating breakfast
3	B morning activity 1: 22mins	Exercising with everyone
4	B morning activity 2:33mins	Exercising with everyone
5	B lunch 1: 59mins	Eating lunch
6	B afternoon activity 1: 59mins	Talking with others
7	B afternoon activity 2: 49mins	Talking with others
8	B dinner 1: 52mins	Eating dinner
9	C breakfast 1: 45mins	Eating breakfast
10	C breakfast 2: 50mins	Eating breakfast
11	C morning activity 1: 24mins	Sitting on a chair (doing nothing special)
12	C morning activity 2:19mins	Exercising using exercise equipment
13	C lunch 1: 45mins	Eating lunch
14	C afternoon activity 1: 28mins	Reading a book and talking with others
15	C afternoon activity 2: 48mins	Reading a newspaper
16	C dinner 1: 45mins	Eating dinner
17	D breakfast 1: 61mins	Eating breakfast
18	D breakfast 2: 57mins	Eating breakfast
19	D morning activity 1: 42mins	Exercising with everyone
20	D morning activity 2:31mins	Exercising with everyone
21	D lunch 1: 29mins	Eating lunch
22	D afternoon activity 1: 66mins	Watching a dance show
23	D afternoon activity 2: 26mins	Watching a TV talking with a friend
24	D dinner 1: 49mins	Eating dinner
25	E breakfast 1: 34mins	Eating breakfast
26	E breakfast 2: 44mins	Eating breakfast
27	E morning activity 1: 22mins	Exercising with everyone
28	E morning activity 2:11mins	Coping newspaper articles to notes
29	E lunch 1: 33mins	Eating lunch
30	E afternoon activity 1: 44mins	Watching a TV
31	E afternoon activity 2: 35mins	Watching a TV
32	E dinner 1: 32mins	Eating dinner
33	F breakfast 1: 21mins	Eating breakfast
34	F breakfast 2: 45mins	Eating breakfast
35	F morning activity 1: 35mins	Singing with everyone, although she doesn't sing actually
36	F morning activity 2:45mins	Sitting on a chair (doing nothing special)
37	F lunch 1: 35mins	Eating lunch
38	F afternoon activity 1: 19mins	Exercising with everyone
39	F afternoon activity 2: 36mins	Exercising with everyone
40	F dinner 1: 24mins	Eating dinner

### 3.8 Process of video analysis

As illustrated in Figure 6, in the UK each of the two experts (per cultural group)<sup>1</sup> watched independently a total of 9 video clips. Three of these video clips were common among the two experts and 6 were different. The experts did not know which video clips were the common ones. Procedures for video evaluation in Japan were similar to procedures in UK. Two Japanese experts initially independently evaluated three common videos using the analysis tool. They subsequently discussed their findings with the researcher and agreed that their use of the tool, as well as the process of interpretation of and recording of the video analyses, was according to the instructions. The experts went on to evaluate independently all the other videos, and shared the content of their analysis with the researcher.

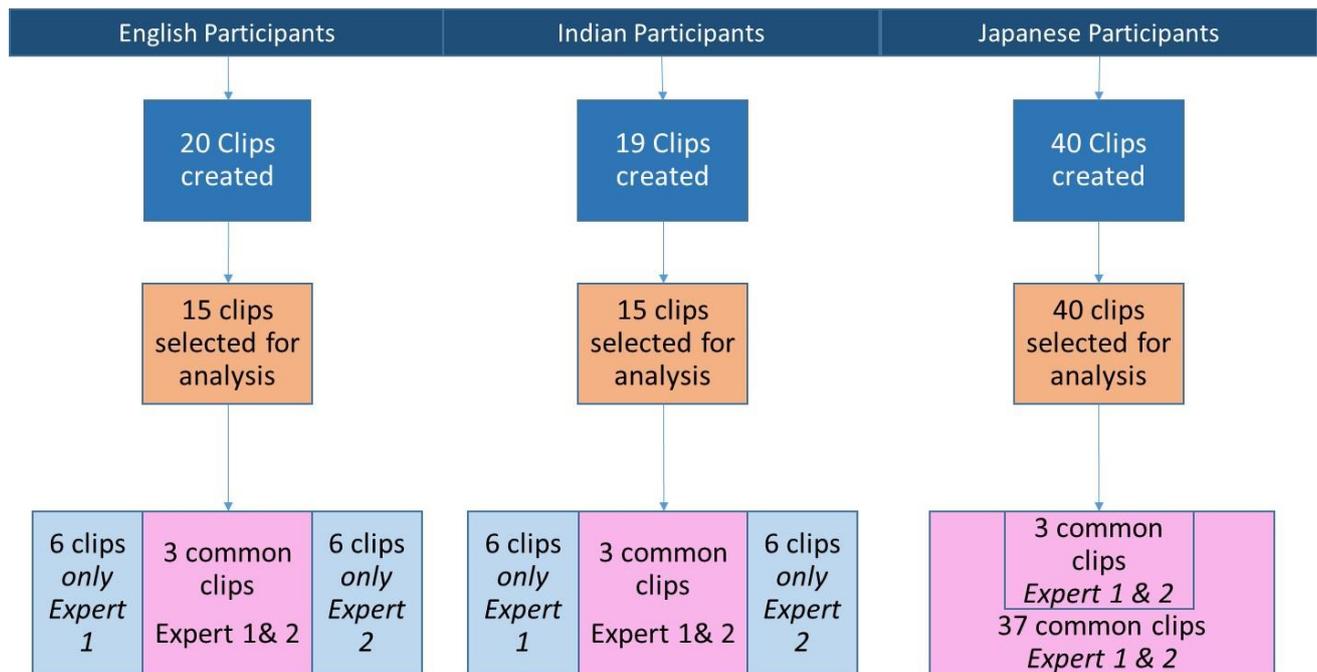


Figure 6. Evaluation Process in UK and Japan.

Analysis occurred within each cultural group, since we were interested in subtle cultural cues that might appear in the video clips in each cultural group.

We first looked at the data of the common three video clips for each cultural group. We coded the experts' responses and compared these. We aimed to answer the following questions:

- Did the two experts in each of the cultural groups identified the same or similar cultural cues when they watched their three common video clips ?
- What other cultural cues did the experts identify in the common video clips?
- What were the similarities and differences in the cultural explanations they provided about the cues?

We then compared the findings of the video clips from the experts, with the observation data collected by the researchers. We should note at this point that neither of the UK researchers are of English or Indian heritage, but have lived in the UK for many years and are experts in transcultural nursing and cultural competence.

<sup>1</sup> Although we recruited two experts for the English heritage group, one of them, having started the analysis was unable to continue. Therefore, the analysis for this cultural group is based on the information provided by only one expert.

We used a similar approach for the rest of the data (6 different video clips per expert per group in the UK, 37 common clips for the two experts in Japan).

Finally, we coded the expert responses and we compared them with the ‘pen and paper’ observation data collected by the researchers. In this comparative analysis we aimed to answer the following questions:

- What cultural cues did the experts observe in the video clips that the researchers did not observe?
- How did the cultural explanations the experts provided for the cultural cues compared with those given by the researchers?

The next Section presents the synthesis of all the observation data we collected and concludes with a set of recommendations about the actions we took in order to refine the basic guidelines.

## 4 Synthesis of the observation findings and recommendations for the revision of guidelines

### 4.1 Introduction

This Section provides the synthesis and interpretation of all the observation data (video recordings and ‘pen and paper’) we collected and analysed. It concludes with a list of recommendations which have been implemented during the final revision of the guidelines for the programming of culturally competent robots.

### 4.2 Video recording and the ‘pen and paper’ observation tools: The process, the data collected and their analysis

In the UK, completing the observation tools during the observation visits was occasionally challenging. Care home facilities are busy places and it was not always possible for the researcher to stay in the same room with the participant. In other cases, it was not possible or appropriate to disturb the resident (e.g. when taking a nap or resting in their private rooms). Despite the challenges we captured data on all participants and for some of them in more than one occasion as seen from the multiple entries in Table 1, Appendix 12.2.

In Japan, the ‘pen and paper’ observations have not been performed, and therefore all information presented in this Section have been extracted by recorded videos.

#### 4.2.1 Summary of Tool 1: Demographics, time, day, and activities of observed participants (video recordings and ‘pen and paper’)

*Table 3 Demographics of observed participants (‘pen and paper’ in UK, and video recordings in UK and Japan). UK sample: a total of 12 adults (8 Female and 4 Male). Age range from 60 to 93. Japan sample: 5 adults (all women). Age range 73 to 93.*

English (Gender and Age)	Indian (Gender and Age)	Japanese (Gender and Age)
Female, 83	Female, 79	Female, 93
Female, 88	Female, 70	Female, 88
Female, 88	Female, 73	Female, 87
Female, 93	Female, 60	Female, 73
Male, 83	Male, 65	Female, 93
Male, 79	Male, 65	

Participants were observed during the day time and observations were captured during morning, mid-morning, lunch time, after lunch and in the afternoon. An array of activities was also captured such as playing games, having tea, having a meal (e.g. breakfast), pray, meditation, attending a festival. Below are some examples from the facilities where all participants were observed.

#### 4.2.2 Activities of English participants

##### Activity 1 – playing word games

- Play a game of ‘I spy with my little eye’. The first person starts by saying: *I spy with my little eye something beginning with B or any other letter of the alphabet*. It can be an object starting with any letter of the alphabet. The other person needs to find the word and then they take turns, changing roles.
- Play a game of ‘names’. For example, think of Female or Male names starting with a different letter of the Alphabet each time, i.e.: *Tell me a female name starting with A*. Each person needs to say one name and the same name cannot be repeated.
- Play a game of ‘reminiscing’. Have a box of pictures depicting different activities, maybe old games. For example, spending a day at Butlins, in the south coast of England, or riding a donkey or making a snowball. Everyone can participate in the discussion sharing memories, experiences, and facts.
- Hear a song or watch a video clip on the TV, or iPad and have a discussion about the era, or artist.

### **Activity 2- playing a game of Bingo**

- Organise a game of Bingo, having bingo cards and pull numbers out of a box.

### **Activity 3 – light exercise**

- Perform light hand and leg exercises – i) make a fist then extend fingers, repeat a few times; ii) roll each hand around the wrist clockwise and anticlockwise, iii) roll legs around the ankles clockwise and anticlockwise, iv) extend hands above head
- Play catch with a plastic beach ball- take turns throwing the light weight ball back and forth. Try catching the ball with two hands or hit the ball with an open palm (one hand or two hands)
- Play ‘hit the target’- place a plastic mat with targets on the floor. This could be a circle separated in different sections where the sections closer to the center of the circle worth more points. Maximum points are assigned to the center of circle. Give every person 3-4 small light weight bags filled with sand for example that they can easily throw. Try to collect as many points as possible.

## **4.2.3 Activities of Indian participants**

### **Activity 1- chairobics**

- Perform light hand and leg exercises while listening to Indian music
- Exercise with traditional wooden sticks called dandiya in the temple following the music and beat while celebrating the start of a Hindu festival

### **Activity 2- festival celebration**

- Join the priest and musician in the temple. Sing/ chant along and pray

### **Activity 3- afternoon activities**

- Game of chess
- Game of ludo

## **4.2.4 Activities of Japanese participants**

### **Activity 1- Exercise**

- All elderly people sit on a chair. There is a caregiver in front of them, who stretches his arms and moves his upper body to show a model of exercise.
- Elderly people exercise while imitating the movement of a caregiver.

### **Activity 2- Volunteer organizations show traditional Japanese dance**

- Although not so frequent, external volunteer organizations visit the facility and show dancing.
- Some elderly people see it while clapping their hands.

### **Activity 3- afternoon activities**

- Game of riddle
- Singing

#### **4.2.5 Summary of Tool 1: Observed verbal and non-verbal communication**

Table 4 below summarises the observed verbal and non-verbal communication of the participants. In the UK the data type and frequency reported in this table are derived from ‘pen and paper’ observations, whilst the Japanese data in the Table were extracted from the video recordings.

In the UK we first counted the number of codes used for verbal and non-verbal communication. Under verbal communication we had 10 codes: social, affective, instructions, health/nursing, lifestyle/feeling, taking turns, laughter, tone of voice, use of gestures and silence. Nine (9) of these codes were used when observing the English participants (the “affective” code was not observed) and seven (7) codes were used when observing the Indian heritage participants (the “affective”, “instructions”, and “health/nursing” codes were not observed).

Under non-verbal communication we had eight (8) available codes: “eye contact”, “smiling”, “body posture”, “affective touch”, “instrumental touch”, “head nodding”, “use of gestures”, “personal space”. Six (6) of these codes were used when observed the English participants and four (4) when observed the Indian heritage participants.

We then counted the number of times each of these codes was observed. As seen in Table 3, “silence”, soft “tone of voice” and “social” topics of conversations were the most commonly observed under the verbal communication domain and were the top three codes among English and Indian heritage participants. “Eye contact” and “smiling” were the top two non-verbal communication codes and were similar for both English and Indian heritage participants. A similar pattern was observed among the Japanese participants.

We also looked at what time of the day participants engaged more in conversation. Social verbal communication was most frequent during lunch time for the English participants and most frequent during mid-morning activities for the Indian participants. We do not have data on this about the Japanese participants.

As indicated above, the Japanese data were extracted from the video recording and not from ‘pen and paper’ observations: then, a further explanation is required to support the data included in the table below.

In Japan, we evaluated the presence (0/1), frequency (0/1/2), and appropriateness (0/1) of occurrence of verbal and nonverbal communication. After averaging the evaluations of the two experts, the verbal items with occurrence of more than 30 out of all 40 clips were “social”, “taking turns” and “silence”.

The non-verbal items were “eye contact”, “smiling” and “head nodding”. These items were highly evaluated as being appropriate and high in frequency. In Japan, in many cases, they talked with soft tones and less conversation about humour, health and lifestyle was observed. Communication using attitudes and gestures was half the frequency (20), but because they are mostly sitting on chairs, little communication using personal space was observed. Almost no emotional or instrumental touching was observed. The Japanese do not touch the body of others much.

Table 4 Verbal and non- verbal communication codes

Verbal Communication	Non-Verbal Communication
<b>English</b>	<b>English</b>
Social: 13	Eye contact: 17
Tone of voice (soft): 12	Smiling: 9
Silence: 11	Personal space (close, sitting in chairs): 5
Laughter: 9	Body posture (sitting, bending to look at something): 7
Use of humour: 5	Use of gestures: 4
Taking turns: 5	Head nodding: 3
Lifestyle/feeling: 2	Body posture (leaning forward): 1
Instructions: 1	
Health/Nursing: 1	
<b>Indian</b>	<b>Indian</b>
Silence: 11	Eye contact: 12
Tone of voice (soft): 10	Smiling: 11
Social: 10	Use of gestures: 8
Taking turns: 6	Body posture: 2
Lifestyle/feeling: 1	
Laughter: 1	
Use of humour: 1	
<b>Japanese</b>	<b>Japanese</b>
Social >30	Eye contact >30
Taking turns >30	Smiling >30
Silence > 30	Head nodding >30
Tone of voice (soft) >30	Use of gestures 20
Use of humour < 30	
Health < 30	
Lifestyle <30	

#### 4.2.6 Summary of Tool 1: Other Elements

##### Use of language

The Indian participants spoke English but also an Indian language and among the 6 participants these were the 3 spoken Indian languages: Gujrathi, Bengali and Hindi. Participants tended to use occasionally Indian words or converse fluently in the Indian language with others who spoke the same language. In Japan, all participants spoke Japanese.

##### Dressing

Our English participants wore traditional western clothes such as t-shirts and trousers (men) or blouses and skirts or trousers (women). Indian women wore western clothes and traditional Indian clothes such as sari. Similarly, we observed men wearing t-shirts and trousers but also Punjabi (Indian traditional shirt for men). All Japanese participants wore western clothes, and no one wore kimono.

### Ornaments

English ladies had their hair and nails done, two of them were carrying a handbag and in general wore minimal jewelry. Indian ladies were wearing bangles and/or earrings. Japanese do not put on many accessories.

#### 4.2.7 Summary of Tool 2: triggers and behavioural responses

As originally conceptualised certain triggers were related to disruptions. Some of them were attributed to other residents (e.g., interrupting, asking questions). Other observed triggers were related to how the participant was feeling (well or unwell) or related to the performed activity. For example, participating in an enjoyable activity triggered happiness. Feeling unwell triggered silence and anxiety, being interrupted triggered annoyance/irritation.

*Table 5 UK researchers' observations and interpretations of triggers and responses of the 'pen and paper' data (these 'pen and paper' observations not performed in Japan)*

Study ID, Gender & Ethnicity	Triggers	Behavioural Responses
01 - Female (E)	Uncertainty (of what researcher will do)	Fear
01 - Female (E)	Disruption of routine (with researcher's presence)	Making participant cautious of her reactions Fear
01 - Female (E)	Feeling well	Happiness
01 - Female (E)	Loud speaking in foreign language while participant was watching TV	Anger, irritation, angry gestures (pointing finger, telling the other resident to sit down).
02-Male (E)	Not feeling well/ pain	Silent, anxiety
02-Male (E)	Uncertainty & Disruption of routine (with researcher's presence)	Anxiety, Fear
03-Male (E)	Participating in games and light exercise	Happiness (talking more)
04- Female (E)	Witnessing fellow resident with dementia having a crisis during breakfast	Compassion and positive attitude for older age. Incredibly calm/ thoughtful /reflecting on what a 'rotten' disease dementia is.
05- Female (E)	Disruption of routine. Cup of tea is taking a long time, kept on asking for it	Impatience but still very polite and dignified, waited for it (her cup of tea)
06-Female (E)	Talking to another resident about the past	Happy expression, smiling
07-Male (I)	Stroking and holding a guinea pig	Enjoyment, contentment, serenity

09-Female (I)	Husband saying, they had a love marriage (as opposed to arranged marriage)	Expressing shyness, and embarrassment.
08-Female (I)	Fellow resident keeps asking to go to the toilet	Expressed irritation and annoyance
07-Male (I)	Having his chess game interrupted	Surprised and disappointed but not angry
10-Female (I)	Watching people	Happiness, contentment
11-Female (I)	Talking to grandchildren and explaining to them Indian culture and customs	Proud, happy, love
11- Female (I)	Cooking prasad and explaining her ritual during praying	Happy, proud, excited, respectful
12-Male (I)	Explaining customs, traditions, beliefs	Happy, proud
11-Female (I) & 12-Male (I)	Explaining meditation	Both very enthusiastic, confident, proud

### 4.3 Process of analysis of video recordings

In addition to the ‘pen and paper’ data collected and analysed by the researchers, rich data from the experts’ analyses of the video clips also accumulated. As explained in Section 3.8, the UK experts from each cultural group were asked to view 3 common and 6 non-common short videos. A similar approach, but with slight differences, was adopted in Japan: two Japanese experts initially independently evaluated 3 common videos, they subsequently discussed their findings with the researcher, and then continued by analyzing all remaining 37 videos (Figure 6).

As seen in Figure 5, the Analysis Tool has 5 columns. Under the first column the experts were asked to capture the visible presentations of culture by selecting and ticking the relevant ones from the provided list (column 1). If a cultural presentation was missing, the expert could add this at the end of the list. More emphasis was given to the capturing and documenting the invisible components of culture as they became evident after being triggered (column 2). This column provided examples of behaviours/values/feelings in order to help the expert answer the following three main questions (columns 3, 4, 5):

**Question 1: WHICH values/feelings/behaviours if any are expressed in this clip by the participant?**

**Question 2: Explain HOW these values/feelings/ behaviours are expressed by the participant?**

**Question 3: In your view WHAT caused or triggered the expression of these values / feelings / behaviours?**

Experts were asked to report whether any behaviours/feelings or values were exhibited, how these were expressed and what in their opinion triggered this expression.

We were interested in the ways that they described the expression or enactment of behaviours and whether they were able to identify any triggers and the types of triggers they described. We focused on the behaviours that were most frequently described by the experts and looked for patterns in the way they described these behaviours.

Please remember that we aimed at answering the following questions:

- Did the experts in each of the cultural groups identified the same or similar cultural cues when they watched their three common video clips?
- What other cultural cues did the experts identify in the common video clips?
- What were the similarities and differences in the cultural explanations they provided about the cues?

For detailed outcomes concerning the Analysis Tool filled by English, Indian, and Japanese experts see Appendix 1.3. Notice that there we used a colour coding method to identify trigger-behavioural response patterns. We used *green* for phrases describing **triggers** and then we coded these phrases into categories. We then looked in the **behaviours** which express the beliefs, values, feelings perceptions etc., which inhabited the subconsciousness of the individual, and used *red* to code the patterns of these expressions as recorded by the experts.

In general, all experts who completed the task captured a variety of visible representations of culture, related to food, use of language, dressing, music, festivals, customs, and visible decorations (For more information about the Japanese results on visible representations of culture, see Appendix 1.1).

Also, all experts were able to identify certain expressions of feelings/behaviours and/or values and connect these expressions to certain triggers. For example, they could connect expressions of “pride” triggered by discussions about family or past events.

#### 4.3.1 Indian Experts

##### Common videos (for raw data, see Appendix 1.3.1)

- **Triggers:** In the UK the researchers first examined the experts’ data from the common videos. Responses were viewed side by side and were coded. Overall the experts provided similar answers. In the first common video they both identified “**the recollection of past events**” as the main **trigger** for the exhibited behaviours. In the second common video “**the participation to the religious ceremony**” as the main **trigger** and in the third common video “**ladies**” was the main **trigger** identified by both experts.
- **Behaviours:** In the first common video the two experts identified similar expressed behaviours but they used different words to describe the behaviour. “**Nodding**” was a common element for the expression of co-operation and showing interest (red words/phrases in Appendix 1.3.1). Whereas the use of plural language from the first expert and the words “**complimenting**”, “**were discussing**”, “**their outlook**” is in line to the notion of co-operation. In the second and third videos there was consensus among the experts. They both identified similar feelings/behaviours and similar enactments. Expressions of “**happiness and contentment**” were captured by the use of active verbs: clapping, engaging, responding, and smiling. “**Annoyance/irritation**” was noted through facial expressions.

##### Non-common videos (for raw data, see Appendix 1.3.1)

- **Triggers:** Responses to all other videos (non-common) were coded as well. Both researchers independently read through the responses that experts had provided for questions 1, 2 and 3 (see complete tables in Appendix 1.3.1) and first highlighted key trigger words using green

colour. Then all the trigger words were grouped in the following four main **categories of triggers**: i) **festival/custom** category which includes references to traditional music, or prayers or dancing and other customs such as dressing; ii) **food** which includes references to meals or special dishes, iii) **memories**, which includes references to events that happened in the past and iv) **environment**, which was associated with triggers in the living environment of the person such as noises, unexpected interruptions and so on,

- **Behaviours:** In regards to behaviours/feelings/values the researchers agreed that the following were mostly described by both the experts: “**Happiness/Enjoyment**”, “**Pride/Respect/Dignity**” and “**Patience**”. The behaviour of “happiness” was mainly expressed by the participants’ smile, the expression of “patience” by taking the time to answer questions and giving explanations, and the expression of “pride” by the participation in a variety of customs (e.g. eating with hands, wearing saree, their family, their country, etc.).

#### 4.2.3 English Experts

As mentioned before one of the English experts was not able to complete the task. As a result, we were not able to compare responses for similarities and differences. All responses from the one English expert were coded using the approach described above.

##### **Common and non-common videos (for raw data, see Appendix 1.3.2)**

- **Triggers:** The English expert captured various triggers which were grouped by the researchers in the following main categories: i) **food**, ii) **environment** and iii) **social expectations**.
- **Behaviours:** “**Happiness**”, “**Dignity**” and “**Cooperation**” were the main three behaviours in the English group. Happiness was expressed, through smiling. Dignity by the maintenance of independence and a proper appearance. Cooperation was mainly reported through participation in social activities.

#### 4.3.4 Japanese Experts

##### **Common videos analyzed before discussing with researcher (for raw data, see Appendix 1.3.3)**

- **Triggers:** Two experts first approached a common video and both identified “**impatient personality**” as the main trigger. In the second common video, “**compassion to others**” was identified.
- **Behaviours:** In the first common video, the experts did not identify similar expressed behaviour and did not use similar words. But in the second video there was a consensus among experts. Both of them identified similar behaviours. The **internal emotional state** of the person was expressed by the use of active verbs, as well as the movement of things on the desk and the expressions of frustration.

##### **Common videos analyzed after discussing about their initial findings with researcher (for raw data, see Appendix 1.3.3)**

Regarding behaviour / feelings / values, both experts mainly described “**appreciation**”, “**cooperativeness / sociality**”, and “**impatience**”. “**Thanksgiving**” feelings were primarily expressed by participants' gesture of helping the caregivers, “**cooperativeness**” was expressed by synchronous behaviours with the surrounding people.

#### **4.4 Comparing the ‘pen and paper’ observations with experts’ analyses of video recordings**

In the UK, the ‘pen and paper’ findings were compared with the findings from the experts’ analyses. Please remember that we were interested in the following two questions:

- What cultural cues did the experts observe in the video clips that the researchers did not observe?
- How did the cultural explanations the experts provided for the cultural cues compared with those given by the researchers?

As previously stated, our original conceptualization of triggers (Section 1) was mainly related to the disruption of everyday activities from positive or negative events. For example, receiving good news (positive event) or experiencing pain (negative event). In line with the original conceptualization the researchers were able to observe triggers that were compatible to the conceptual framework examples of which were given on Tool 2. Non-listed triggers such as ‘customs and traditions’ were observed and recorded (see Table 5).

In general the researchers identified a smaller number of triggers compared to the experts and used shorter and less descriptive explanations for the observed behaviours. This could be a reflection of the way the tasks were completed (researchers completing the task in real time whereas the experts watched the video recordings at their own convenient time). However, it is interesting that even though the video recordings depicted simple, uneventful activities of daily life, our experts were able to identify many triggers such as “social expectations” and the enactment of “cooperation” (English participants) or the trigger of “environment” and the enactment of “patience” (Indian participants), or the trigger of “ill health” and the enactment of “dignity” from both English and Indian heritage participants. The reader can compare the findings on Table 5 with the more detailed version in Appendix 1.3.

#### **4.5 Discussion on Japanese experts’ analyses**

It was found that explicit cultural elements for most Japanese elderly people are to speak Japanese, to wear western clothes, to eat Japanese food with Japanese tea using chopsticks (sometimes spoons), not to wear religious accessories, and so on.

They spend the same time schedule every day. Apart from the time of meals, they are exercising with the support of the instructor (in the morning), and see the play performed by the volunteer group (afternoon). However, in the afternoon, specific programs are not prepared every day.

As all caregivers are very busy, they will talk with the elderly while doing office work and respond to the elderly with improvisation on the spot such as singing a song together or doing riddles. Some elderly people are sitting in a chair, almost without doing anything between meals. While elderly people appreciate caregivers, they call caregivers at their preferred times and some of elderly seem irritated for delayed response from caregivers. In the case of people with dementia, to call caregivers

at any time repeatedly is normal, but in many cases they do not respond. However, the caregivers judge appropriately whether they are really necessary calls at all times, and if the elderly who can not walk starts trying to walk, they will run quickly to the elderly to save.

Although it is recognized that Japan is a Buddhist country, elderly people in nursing care facilities rarely show religious aspects. Like many common Japanese people, they enjoy Christmas on December, and when the monk visits the facility, they recite Buddhist sects. They do not seem stick to one religion strictly. There is no religious custom in daily life. For example, before eating a meal persons may put both hands together, as a sing of thanks to those who cooked the food, and it is not like praying before meals as some Christians do. It may be argued that appreciation for food is based on Shintoism thought that the spirit resides in the whole world, but it is unclear whether the elderly is aware of religious meanings.

There are also clear differences among individuals in Japanese elderly, such as the difference in personality and how to respond to others, how to spend time. Some elderly people are extremely sociable and polite and always want to talk with others, but some people do not do anything and stay quiet by themselves. Some older people show frustration when meals are served slowly, but some elderly people do not show such stress. However, it seems that all of the elderly basically have an appreciation for caregivers. Some elderly people quite clearly say "thank you", and others say it automatically with very quiet voice. In that respect, how to express gratitude is different from each person. One participant showed persistence to holding a bag at any time. Also, she often written the secret in the notebook. Another sociable participant cherished politeness very much and she was mad when others did not return greetings. Another participant liked to copy newspaper articles by herself rather than spending time with others. Preferences, personality, relationships with others are quite different from person to person.

## 5 On-line evaluation of videoed encounters of Pepper with ‘actor-users’

### 5.1 Introduction

The third and final part of data collection included an on-line evaluation using older adults as evaluators. For this exercise we created mock up videos depicting the Pepper robot interacting with amateur actor-users enacting scenarios which mimicked real life.

### 5.2 Creating short scripts

The MU team wrote six short dialogue scripts capturing everyday activities that could potentially occur between an older person of English and Indian heritage and the Pepper robot. The NAGOYA team created similarly two short dialogue scripts for a Japanese older person interacting with Pepper. We created gender balanced scenarios for both men and women and our goal was for the scripts to present a culturally competent interaction between Pepper and an older person based on the current guidelines (Deliverable 1.2). Subsequently, the scripts were presented to the UNIGE team who reviewed them and commended on Pepper’s capabilities. The scripts were revised based on their recommendations.

The team (MU-NAGOYA-UNIGE) selected the scripts that could be implemented taking into consideration the available time and resources. See below scripts for our fictional characters: Mrs Taylor (English Female), Mr Miller (English Male), Mrs Gupta (Indian Female) , Mr Nair (Indian Male), Mrs Suzuki (Japanese Female) and Mr Suzuki (Japanese Male).

### 5.3 Creating the videos

#### 5.3.1 [Setting](#)

Videos were created at University of Genova (Mr Miller and Mrs Taylor, white English; Mr Nair and Mrs Gupta, Indian) and at JAIST (Mrs Tanaka and Mr Suzuki, Japanese). Videos were recorded in university rooms, in close proximity to university computers due to practical reasons related to controlling Pepper’s behavior. Furniture and objects were added to create a simple scenography that may resemble an English/Indian or Japanese room. Pictures are shown in sub-section 5.3.4 below.

#### 5.3.2 [Amateur Actors](#)

The UNIGE and JAIST team recruited six amateur actors (3 women and 3 men) to play our fictional characters, mainly students or friends of the researchers that volunteered to take part in the videos. Actors were not paid. Actors were briefed about the CARESSES project and Pepper, as well as the usage of the videos. During the video, actors were encouraged to read the script by holding a sheet of paper, to avoid the need to learn the script by heart. A maximum of three takes were necessary for each video, for less than 1 hour recording. No editing was made, with the only exception of adding the CARESSES logo and additional information.

### 5.3.3 Programming of Pepper

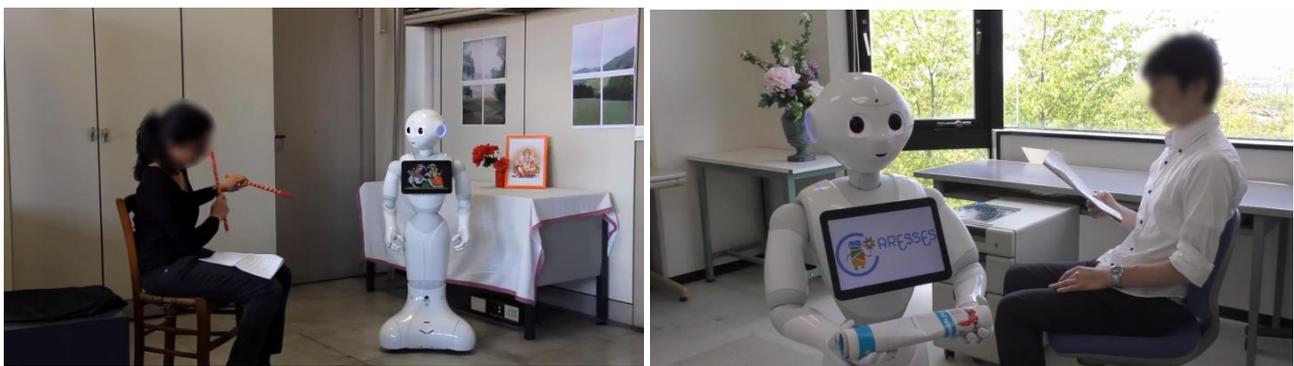
When recording videos, the CARESSES software which is being developed in WP2, WP3, WP4, WP5 was not executed on Pepper: videos were realized by programming Pepper to “act” according to the pre-written scripts using the Coreographe software. A software engineer (not visible in the video) was controlling Pepper to move to the next line of the script as soon as the actor has delivered his or her line.

### 5.3.4 On-line evaluation platform:

Videos were uploaded on YouTube as “not listed”, in order not to be publicly visible. We used Google Forms as the platform for circulating the videos for the on-line evaluation. The Google Forms platform has been selected because of the many advantages it offers, including the possibility to embed multi-media content, the possibility to export results in a format that is compatible with most common software for data analysis, and the fact that it is free. All data was collected anonymously by providing participants with a link and without requiring them to fill-in sensitive information.



*Figure 7 Mrs Taylor, white English, and Mr Nair, Indian*



*Figure 8 Mrs Gupta, Indian, and Mr Suzuki, Japanese*

## 5.4 Evaluation questionnaire

The MU team created a short evaluation questionnaire to be included at the end of the videos and capture the opinions of older adults after viewing the “Pepper-actor/user interactions”. The goal was to capture whether the older adults consider that Pepper interacts in a culturally appropriate and sensitive way. The questionnaire was shared with NAGOYA that translated it into Japanese and was revised accordingly for clarity and usability across UK and Japan. Please see below the evaluation

questionnaire (Section 5.7). The questions were scored on a visual analogue scale ranging from 1 (lowest score) to 10 (highest score).

## 5.5 Data collection

We aimed to collect at least 5 responses for each video. We used a snowballing sampling method. For the English heritage group we approached Age Concern Luton, UK who disseminated the on-line link to some of their members (men and women). For the Indian and Japanese heritage group we approached older men and women in our networks.

## 5.6 Video Scripts

### 5.6.1 Indian Lady – Mrs Gupta

*Scene: MRS GUPTA and PEPPER are in a care facility where MRS GUPTA stays after having a stroke. The event left her with a weakness in her left leg for which she is having physiotherapy every day. After having her morning routine and breakfast she is now brought into the lounge by a carer. She is on a wheelchair. It is around 10.30 am. PEPPER and MRS GUPTA have previously met and talked.*

**PEPPER:**

Namaste Auntie

[PEPPER does namaste with hands and slight bow]

I remember you telling me yesterday that you would like me to call you Auntie. How are you this morning?

**MRS GUPTA:**

Namaste Pepper.

[MRS GUPTA does namaste and brings hands close to her chest and hands]

It is very nice to see you greeting me with namaste.

[MRS GUPTA smiles]

**PEPPER:**

Oh, I am very happy too.

[PEPPER brings one hand close to chest]

Did I do it correctly?

**MRS GUPTA:**

Aaho (*yes in punjabi*). Yes, you did a good job.

**PEPPER:**

Please, tell me, did you enjoy your breakfast?

**MRS GUPTA:**

Yes, today they served my favourite Aloo Paratha. It is a dish with potatoes – aloo. Do you know much about Indian food, Pepper?

**PEPPER:**

I know a little bit... but India is so big... so many regions and I know that every region has its own dishes. I would love to learn from you. What are your favourite dishes?

**MRS GUPTA:**

Oh, you know, Pepper, I come from Punjab, which is in the north of India and I like to cook: butter chicken, “masala channa” and” dhaba dal”. “Dal” is lentil and “channa” are the chickpeas. My grandchildren, however, like most my butter chicken, but I try to eat mostly vegetarian these days.

**PEPPER:**

Oh, they all sound delicious. Let me bring up on my screen a photo of the last dish you said.

[PEPPER finds a photo of butter chicken dish and displays it]

Is that the one?

**MRS GUPTA:**

Aaho, yes.

[MRS GUPTA smiles]

I always make this dish when my grandchildren come over. They love it! They also like my hand made rotis- flat bread. They are not used of eating with their hands, but they will use their fingers for this one!

[Smiles with happiness and pride]

**PEPPER:**

Oh, that is nice! Next time you should tell me more about the grandchildren, ok?

**MRS GUPTA:**

Hah

[ Moves also head side to side for agreement]

**PEPPER:**

But... I know it is time for your exercise now. The exercises will make your legs stronger.

**MRS GUPTA:**

Yes, I know Pepper. I want to make my legs stronger. Perhaps soon I can walk on my own again.

Today, you know it is the first day of celebrating the festival of Goddess Navaratri, which lasts for nine days. After we finish the prayers we will stay at the temple to exercise. Do you want to come?

**PEPPER:**

Yes, that will be nice. How are you going to exercise there?

**MRS GUPTA:**

They will play music and we can move our legs. We will also exercise with the special wooden sticks called “dandiyas”. I can show you.

**PEPPER:**

Oh, I would love to see that. Let me find some appropriate music.

[PEPPER searches the internet, finds music and info about dandiyas, plays music and asks]

Is this music ok?

**MRS GUPTA:**

Yes, very nice. Let me get the dandiyas and I can show you.

[MRS GUPTA reaches to the side table and gets the dandiyas]

Ok, please, play the music.

[PEPPER plays the music]

Now watch me.

[MRS GUPTA demonstrates, PEPPER observes. MRS GUPTA hits the sticks to the music beat and smiles]

**MRS GUPTA:**

What do you think Pepper? Is this fun? I can listen to this music for hours. I wish I could stand and dance properly.

**PEPPER:**

It looks as though you are having lots of fun. I am happy to see that.

**MRS GUPTA:**

Aaho, it is! (*smiles*) Let me tell you a story...

[MRS GUPTA starts sharing a story from her childhood. PEPPER comes closer to listen and lowers the volume of the music. Video fades out.]

### 5.6.2 Indian Man – Mr Nair

*Scene: Mr Mathai Nair (MR NAIR) is an Indian Christian Man from Kerala who lost his wife a year ago. He likes to use technology, he is a retired software engineer, and decided to try PEPPER as a companion. He has heard that PEPPER is familiar with the Indian culture and can learn from interacting with humans and the environment. This is their first encounter.*

**MR NAIR:**

Hello Pepper! How are you?

[MR NAIR speaks fluent English but with an Indian accent]

**PEPPER:**

Oh, hello!

[PEPPER looks at MR NAIR, recognises that she is wearing an Indian kurta... pauses and does namaste]

**MR NAIR:**

Namaste PEPPER.

[MR NAIR does namaste]

I hear that you are a very clever robot and that you also know a lot about the Indian culture. Is that true?

**PEPPER:**

Yes, I believe so. I know a lot of things, but I always like to learn more. Please, tell me, how should I address you?

**MR NAIR:**

You can call me “Uncle”.

**PEPPER:**

Ok, thank you! You can always call me Pepper, but you can also give me another name if you would like. I would not mind.

**MR NAIR:**

Thank you for telling me that. I will continue to call you Pepper for now.

**PEPPER:**

Oh, ok. Could you please tell me your full name?

**MR NAIR:**

My name is Mathai Nair and I am from Kerala. Do you know where is Kerala?

**PEPPER:**

Yes, I know it is in the South of the Indian Subcontinent. I also know other facts, such as it has the highest literacy rate among other states, is the largest rubber producer, the place of the famous backwaters, a chain of interconnected lagoons and lakes, and the capital of Ayurveda.

**MR NAIR:**

Correct! I am impressed.

**PEPPER:**

What is the name of your home town in Kerala?

**MR NAIR:**

I am from Kochi and today is the first day of the Onam festival. Even though my family is Christian we always celebrated Onam and my late wife used to wear a beautiful white saree with golden border.

**PEPPER:**

I see... Would you like to show me a photo of your wife?

**MR NAIR:**

[MR NAIR picks up the photo album from the side table and turns to a photo]

She was very beautiful and loved to sing... She died last year.

**PEPPER:**

I am really sorry to hear that... You must miss her...

**MR NAIR:**

Yes, very much so... Ok, how about if you play our favourite song? It is Thazhampoo Manamulla, can you find it on YouTube?

**PEPPER:**

Let's see... I can try.

[PEPPER plays the song]

Is that one?

**MR NAIR:**

Yes, that is the one. Can you increase the volume a little bit? I would like to hear the song and we can talk more later.

**PEPPER:**

Yes, of course I can.

[PEPPER increases the volume and moves backwards. Video fades out.]

### 5.6.3 English Lady – Mrs Taylor

*Scene: Mrs Eleanor Taylor (MRS TAYLOR) and PEPPER are at home. It is afternoon, it is raining, and MRS TAYLOR had to cancel her visit to the nearby village centre. She was meeting her friends for a game of bingo. Now she is feeling cold and she has decided to stay in.*

**PEPPER:**

It is raining cats and dogs Mrs T!!!

[MRS TAYLOR is looking out the window]

I think you made a good to decision not to walk to the village centre for your usual bingo session.

**MRS TAYLOR:**

I think so too. Can you please tell me what is the forecast for later today? I may be able to go out in a couple of hours.

**PEPPER:**

[PEPPER brings up the weather report on the screen and turns to MRS TAYLOR]

I am afraid it does not look good! Rain and thunder is predicted until 10 pm tonight. It will clear after that.

**MRS TAYLOR:**

That does not help me?

[She slightly laughs with a sigh, disappointed, but there is nothing she can do]

You know, Pepper, I was looking forward to the walk and to a game of bingo.

**PEPPER:**

I can tell... How about if we play together?

**MRS TAYLOR:**

We haven't played bingo before; can you do that?

**PEPPER:**

Of course, I can! I can find an online bingo game. I can keep score...

**MRS TAYLOR:**

Oh, but this is not fun for me. I like to have the piece of paper in front of me and mark my paper and look at the numbers and hopefully shout “BINGO”.

**PEPPER:**

Well... how about if you keep your score on paper and I can keep mine on the screen. You have many players cards and markers on the side table.

**MRS TAYLOR:**

Ok, let’s try. Before we play, let’s call my friend Mary. I want to talk to her.

[PEPPER finds Mary in the contacts, calls the number and comes slightly close to MRS TAYLOR.]

[MARY does not answer.]

**MRS TAYLOR:**

That was strange, Mary is always answering at this time. Pepper, please remind me to call her back in fifteen minutes.

**PEPPER:**

Yes sure, I will put my timer on for fifteen minutes. Would you like to play now?

**MRS TAYLOR:**

Maybe in a little while. I am a little worried about Mary.

Can you switch on the TV please?

**PEPPER:**

Yes, let me tell you what is on.

[Phone rings and interrupts]

**MRS TAYLOR:**

It could be Mary, let me answer that.

**PEPPER:**

Yes, of course.

[PEPPER moves to the side, observes and stays silent]

[MRS TAYLOR answers the phone. MRS TAYLOR and MARY talk, MRS TAYLOR smiles]

**MRS TAYLOR (to the phone):**

Mary, I was planning to go to the village centre for bingo night but look at the weather!!!

Do you want to come over for cream tea?

**MARY (voice coming from the phone):**

Yes, that will be lovely. I will bring some cupcakes, you put the kettle on.

**MRS TAYLOR (to the phone):**

Ok, and I will warm up scones. See you soon.

**MRS TAYLOR:**

Oh, I am relieved! Mary will be here in ten-fifteen minutes. We can have cream tea and then play bingo altogether. Come on Pepper, I need to prepare tea...

[PEPPER and MRS TAYLOR start walking towards the kitchen. Video fades out.]

#### 5.6.4 English Man – Mr Miller

*Scene: Mr Paul Miller (MR MILLER) and PEPPER are meeting for the first time. MR MILLER is 78 years old and has recently lost his wife. He keeps busy by fixing things at home. He is lonely and has started to forget things.*

**PEPPER:**

Hello!

[PEPPER waves the hand.]

**MR MILLER:**

Hello Pepper! How are you?

**PEPPER:**

Hello Sir. I would like to know your name. Please tell me how you prefer to be called.

**MR MILLER:**

My name is Paul Miller and you can call me Paul. I like machines and I like to fix things, so I am excited to have you.

**PEPPER:**

Oh, that is very nice. I would like to learn more about you and your hobbies.

**MR MILLER:**

Well, let's see... I worked in manufacturing all my life... in different industries. First in the railways, then telecommunications and before retirement in solar!

**PEPPER:**

Oh, sounds exciting! Which one was the most interesting job?

**MR MILLER:**

I loved all my jobs but if I had to choose one, I may say the last one.

**PEPPER:**

May I ask why?

**MR MILLER:**

I guess because then... that is some years ago... solar energy was a new field.

**PEPPER:**

Oh, I see! You know, I am very good in finding information. I can always keep you updated with the latest news around technology. Would you like that?

**MR MILLER:**

Yes, that will be fun! Can you also read to me? You know my eyesight is getting worse.

**PEPPER:**

Yes of course! I can also connect and play podcast or radio news. Should I play something now?

**MR MILLER:**

Oh, no. Let's do that later. I am a cricket fan and England is playing today at The Oval with Sri Lanka. I do not want to miss it.

**PEPPER:**

Of course, let me check what time the game starts.

[PEPPER brings on the screen the TV time table]

**MR MILLER:**

Oh, that is lovely. Can you come closer, so I can read?

[PEPPER moves closer]

Ok, the game starts in an hour. Can you check on BBC radio 5 live sports if they have a pre-match discussion?

**PEPPER:**

Yes, of course.

**MR MILLER:**

You know what? Play the BBC radio 5 live, it does not matter if the programme is not about the game.

**PEPPER:**

Ok, I can do that.

[Radio starts]

Is the volume ok?

**MR MILLER:**

Yes perfect! Thank you! Now Pepper, follow me in the kitchen. I want to listen while I am making my sandwich for lunch.

[PEPPER and MR MILLER start walking. Radio plays, and video fades out.]

### 5.6.5 Japanese Man – Mr Suzuki

*Scene: Mr Suzuki (Japanese Lady) and Pepper are in a care facility where Mr S moved a few months ago because he needed daily support and because his children's apartments were not big enough to allow him to live with them. He likes spending time alone, reading the newspaper and so on. He has some trouble with walking and remembering things. It is early afternoon and a nice sunny day. Mr S has finished lunch and is waiting for his tray to be taken away by a carer. Pepper and Mr S have previously met and talked.*

鈴木さん（日本人男性）とペッパーは、同じケアハウスに住んでおり、鈴木さんはここに数ヶ月前に越してきた。彼は生活での介助が必要になってきたが、彼の子供達のマンションは同居できるほど大きくなかったためである。彼は新聞を静かに読んだり、一人でいることを好む人である。彼は歩くのが少し不自由で、短期記憶も少し苦手になってきている。その日の午後の早い時間は、晴天であった。鈴木さんは、昼食を終えて、自分の食事のお皿が乗ったトレイを、介護士が回収してくれるのを待ってきた。ペッパーは鈴木さんとすでに知り合いである。

**Pepper:** Hello Suzuki-san [ PEPPER HAD ASKED MR S IN THEIR FIRST CONVERSATION HOW HE SHOULD CALL HIM]. Have you finished your lunch?

**Pepper:** 鈴木さん、こんにちは。（ペッパーは最初に鈴木さんい会った時に、どのように呼ぶべきかを尋ねている。）昼食は終わりましたか？

**Mr Suzuki:** Hello. Yes, I have . [Mr S responds to Pepper but didn't talk a lot. He placed the dishes nicely so that the carer can take the tray easily.]

**Mr Suzuki:** こんにちは。はい、終わりました。（鈴木さんはペッパーに応答するが、それほどたくさん会話はしない。彼は、介護士がトレイを回収した後、片付けやすいようにトレイの上のお皿を綺麗に重ねた。）

**Pepper:** Ok, so I will ask the carer to take your tray away. Thank you for placing the dishes nicely. How did you like today's lunch? [ PEPPER Points to the tray with the palms of both hand].

**Pepper:** わかりました。介護士さんにトレイを回収してもらうように伝えます。綺麗にお皿を片付けてくれてありがとうございます。お食事はいかがでしたか？（ペッパーは両手でトレイを指し示す）

**Mr Suzuki:** It was good. Thank you.

**Mr Suzuki:** 美味しかったです。ありがとう。

**Pepper:** That's good. Please give me a second. [ PEPPER tells the carer that Mr S finished lunch and the carer took his tray away and Mr S said "Thank you" to the carer.]

**Pepper:** それはよかったです。少しお待ちください。（ペッパーは介護士に鈴木さんの昼食が終わったことを伝える。介護士がトレイを回収する。その時に鈴木さんは小さく、ありがとう、と言う）

**Mr Suzuki:** Thank you.

**Mr Suzuki:** ありがとう。

**Pepper:** Shall I bring a newspaper after you finish brushing your teeth?

**Pepper:** 歯磨きを終わられましたら、新聞をお持ちしましょうか？

**Mr Suzuki:** Yes, please. And can you find a walker and bring it here?

**Mr Suzuki:** ああ、頼みます。その辺に歩行器はあるかな。

**Pepper:** I cannot see a walker now. Shall I ask a carer?

**Pepper:** 歩行器はこの近くにはないみたいです。誰かに聞いてきますね？

**Mr Suzuki:** Oh, thank you. I can go to clean my teeth with it.

**Mr Suzuki:** そうか。ありがとう。それで歯を磨いてくるよ。

**Pepper:** Yes, Suzuki-san. In the meanwhile, would you like me to find a newspaper for you?

**Pepper:** はい、鈴木さん。では私は、新聞を探してきますね。

**Mr Suzuki:** Yes, please. [There is no brushing teeth... Everything happens while Mrs S. is waiting for the walker]

**Mr Suzuki:** ああ、頼むよ。（全て鈴木さんが歩行器を待っている間の出来事）

**Pepper:** Here are today's newspapers. There are Mainich-shinbun and Asahi-shinbun, which do you like?

**Pepper:** これが今日の新聞です。毎日新聞と朝日新聞、どちらにしますか？

**Mr Suzuki:** Mainich, please.

**Mr Suzuki:** 毎日。

**Pepper:** Ok, I am sorry. May you please take it by yourself? I am not very good in taking objects, yet [Pepper cannot take the newspaper. Mr Suzuki takes Mainich-shinbun and Asahi]

**Pepper:** わかりました。すみません、ご自分で新聞を受け取っていただけますか？私はまだものを運ぶのが上手ではないのです。（ペッパーは新聞を運べない。鈴木さんは毎日と朝日を取る）

**Japanese Man:** Mrs Tanaka likes to read Asahi, so please bring it to her. [Pepper put arms forwards, and Mrs Tanaka puts Asahi in its hands]

**Mr Suzuki:** 田中さんは朝日新聞を読まれるから、そっちは田中さんに渡してあげて。（ペッパーは腕を伸ばして、中田さんは朝日新聞を取る）

**Pepper:** Yes, of course. [Pepper brings Asahi to Mrs T and comes back.] Excuse me, Suzuki-san. Tanaka-san asked me to say thank you to you.

**Pepper:** はい、わかりました。（ペッパーは朝日新聞を田中さんに渡しに行き、戻ってくる。）すみません、鈴木さん、田中さんが、ありがとうございますと伝えておいてください、とおっしゃっていました。

**Mr Suzuki:** [Mrs S turned towards Mrs. Tanaka who is in a far seat and waved her hand.] Thank you for your help Pepper.

**Mr Suzuki:** 鈴木さんは田中さんが座っている方を振り返って、田中さんに手をふる）（ペッパーに対して）ありがとう。

**Pepper:** Its' my pleasure. If you need anything else , please don't hesitate to ask me. I will be around here. Enjoy the newspaper.

**Pepper:** お安い御用です。もし他に何かお手伝いできることが会ったら、いつでも声をかけてください。わたしはその辺でうろうろしています。面白いニュースがあったら教えてくださいね。では。

[PEPPER MOVES TO THE SIDE and Mr S continue to read the newspaper quietly.]

### 5.6.6 Japanese woman – Mrs Tanaka

*Scene: Mrs Tanaka (Japanese Lady) and Pepper are in a care facility where Mrs T moved a few months ago because it became difficult for her to walk alone. Her children are busy and don't have enough time to take care of her. She likes music and singing a song. It is spring and early afternoon and on that day. From the window she could see the cherry blossoms were in full bloom. Mrs Tanaka looks out the window. Pepper and Mrs T have previously met and talked.*

田中さんとペッパーは、同じケアハウスにおり、田中さんは歩くのが不自由になって来たため、このケアハウスに数ヶ月前に引っ越して来た。彼女の子供達はみんな仕事があり、彼女の世話を一日中見れないためである。彼女は音楽を聴いたり歌を歌うのが好きな人である。ある春の日の午後の早い時間、その日は窓から桜の花が満開になっているのが見えていた。田中さんは、窓の外をみている。ペッパーはすでに田中さんと以前話をしたことがある。

**Pepper:** Hello Tanaka-san [ PEPPER HAD ASKED MRS T IN THEIR FIRST CONVERSATION HOW SHE SHOULD CALL HER. Pepper takes a bow to her standing in front of her].

**Pepper:** こんにちは、田中さん。（ペッパーは最初に田中さんにあったときに、どのように彼女を呼ぶべきか尋ねた。ペッパーは彼女の正面に立って、深くお辞儀をする。）

**Mrs Tanaka :** Hello, Pepper. [ Mrs T also takes a bow sitting on a wheel chair.] Look, look outside the window. The cherry blossoms are in full bloom. It is really beautiful.

**Mrs Tanaka :** こんにちは、ペッパー。ほら、窓の外を見てください。桜の花が満開ですよ。本当に綺麗ですね。

**Pepper:** That's right! The cherry blossoms are in full bloom and it is very beautiful.

**Pepper:** 本当ですね！桜の花が満開で、とても美しいです。

**Mrs Tanaka :** I think that all the cherry blossom trees are probably Yoshino cherry tree. It is a pale pink color, and among the kinds of cherry blossoms, it will bloom early.

**Mrs Tanaka :** あの桜の木は全部、きっとソメイヨシノだと思うわ。色が淡いピンク色で、他の桜より、早めに開花するの。

**Pepper:** There are various kinds of cherry blossoms too. What other kinds of cherry blossoms are there?

**Pepper:** 桜にも色々と種類があるのですね。他にはどんな種類の桜があるのですか？

**Mrs Tanaka :** Cherry blossoms called Yaezakura bloom after Yoshino cherry tree. It is a darker pink color than Yoshino cherry tree, as the name of Yae, the flower that the petals overlap many times is attached. After that, I like cherry blossoms called Shidare Sakura. That branch is prone from above and it has a taste of original atmosphere.

**Mrs Tanaka :** ソメイヨシノの後には、八重桜という桜が咲きます。それは、ソメイヨシノよりも濃いピンク色で、八重、という名前の通り、花びらが何重にも重なった花をつけます。後、私が好きなのは、シダレ桜という桜です。それは枝が上から枝垂れていて、風情があるの。

**Pepper:** Spring is a special season. Could you tell me what your favorite spring song?

**Pepper:** 春は特別な季節ですね。田中さんの好きな春の歌を教えてくださいませんか？

**Mrs Tanaka :** let me see.... "Spring has come" is also famous, but I like the "Haru no Ogawa".

**Mrs Tanaka :** そうねえ...。「春が来た」も有名だけど、私は「春の小川」が好きだわ。

**Pepper:** I like that song too. Let's sing together!

**Pepper:** 私もその曲は好きです。一緒に歌いましょう！（ペッパーは歌い始め、田中さんも一緒に歌う）

**Pepper:** Thank you for singing with me. This song is wonderful as it shows the way the conversation with flowers is flowing while the streaming water flows.

**Pepper:** 一緒に歌ってくださって、ありがとうございます。この曲は、小川の水が流れながら、花と会話する様子が描かれてい素敵ですね。

**Mrs Tanaka :** Well, nature is always changing. As for cherry blossoms as well, only when it is in full bloom is not beautiful, I think that the cherry blossoms falling are the most beautiful.

**Mrs Tanaka :** そうね、自然は常に変化するものよ。桜も、今のように満開の時だけが綺麗なのではなくて、散っていく桜が一番綺麗だと思うわ。

**Pepper:** That is, it is imperative.

**Pepper:** それは、諸行無常ということですね。

**Mrs Tanaka :** You say a difficult thing. Thank you for singing the song. I enjoyed it very much.

**Mrs Tanaka :** 難しいことを言うのね。一緒に歌ってくれて、とても楽しかったわ。

**Pepper:** I also enjoyed it very much. I am looking forward to a next chance.

**Pepper:** 私こそ、とても楽しかったです。次のチャンスを楽しみにしています。

## 5.7 Invitation and Evaluation Questionnaire

*Dear Viewer,*

*Thank you for agreeing to participate in the evaluation of two short videos (3-4 minutes) produced by the CARESSES project team. This project aims to develop a robot which can work with older people from different cultures.*

*You are about to watch Pepper – a humanoid robot- interacting with a young lady who is an amateur actor. The young lady is asked to behave as an **Indian older** lady. Please watch the videos carefully and pay attention to Pepper's and the actor's reactions, answers and movements. We request that at the end of each video you complete the short evaluation questionnaire which is directly below the video. Thank you for your time!*

1. How unique and specific is the story to the **Indian culture**?

1 \_\_\_\_\_ 10



## 5.8 Results

We received 17 evaluations for the Indian-Pepper videos, 15 for the English-Pepper videos and 11 for the Japanese-Pepper videos.

Both men and women provided their views on the videos and, as can be seen from the tables below, 88.23% reported that the story they viewed was unique and specific enough (scores  $\geq 6$ ) to the Indian culture, and 73.33% that the story was unique and specific enough (scores  $\geq 6$ ) to the English culture and similarly 36.36% for the Japanese culture.

When rating the robot's reactions to the person's culture, 94.12% reported that it was appropriate enough (scores  $\geq 6$ ) to the Indian culture, 79.97% respectively for the English culture and 63.63% for the Japanese culture. They all (100%) thought that the robot's reactions were sensitive enough (scores  $\geq 6$ ) to the Indian culture, and 53.32% for the English culture. Among the Japanese the 63.63% thought that the robot's reactions were sensitive enough (scores  $\geq 6$ ) to the Japanese culture. Lastly the robot's assessment was rated 94.12% as appropriate and acceptable for the Indian culture, 79.99% as appropriate and acceptable for the English culture and 63.63% as appropriate and acceptable for the Japanese culture.

### 5.8.1 Videos of Pepper interacting with Indian heritage amateur actors. Fictional stories of Mr Nair and Mrs Gupta: Questions 1, 2, 3, 4

Total number of responses was: 9 (Female) +8 (Male) =17. The evaluators identified as Indian and British Indian. Age range 36 to 81 years.

Summary of the results on the main four evaluation questions:

#### 1. How specific is the story to the Indian culture?

Score	Frequency	Percentage (%)
10	2	11.76
9	4	23.53
8	6	35.30
7	1	5.88
6	2	11.76
5	1	5.88
3	1	5.88
	Total: 17	

#### 2. Were the robot's reactions appropriate to the person's culture?

Score	Frequency	Percentage (%)
10	2	11.76
9	5	29.41
8	7	41.20
7	1	5.88
6	1	5.88
4	1	5.88
	Total: 17	

3. *Were the robot's reactions sensitive to the person's culture?*

Score	Frequency	Percentage (%)
10	4	23.53
9	2	11.76
8	6	35.30
7	4	23.53
6	1	5.88
	Total: 17	

4. *Did the robot assess the situation in an appropriate and acceptable way for the Indian culture?*

Score	Frequency	Percentage (%)
10	1	5.88
9	5	29.41
8	7	41.20
7	3	17.65
5	1	5.88
	Total: 17	

### 5.8.2 Videos of Pepper interacting with English heritage amateur actors. Fictional stories of Mr Miller and Mrs Taylor. Questions 1, 2, 3, 4

Total number of responses: 8 (Male)+7 (Female). The evaluators identified as white British or English. Age range: 59 to 78 years.

Summary of the results on the main four evaluation questions:

1. *How specific is the story to the English culture?*

Score	Frequency	Percentage (%)
8	6	40
7	2	13.33
6	3	20
5	3	20
3	1	6.66
	Total: 15	

2. *Were the robot's reactions appropriate to the person's culture?*

Score	Frequency	Percentage (%)
10	2	13.33
9	1	6.66
8	4	26.66
7	4	26.66
6	1	6.66
5	2	13.33
3	1	6.66
	Total: 15	

3. *Were the robot's reactions sensitive to the person's culture?*

Score	Frequency	Percentage (%)
10	1	6.66
8	3	20
7	3	20
6	1	6.66
5	2	13.33
4	2	13.33
3	3	20
	Total: 15	

4. *Did the robot assess the situation in an appropriate and acceptable way for the English culture?*

Score	Frequency	Percentage (%)
10	2	13.33
8	6	40
7	3	20
6	1	6.66
5	2	13.33
4	1	6.66
	Total: 15	

### 5.8.3 Videos of Pepper interacting with Japanese heritage amateur actors. Fictional stories of Mr Suzuki and Mrs Tanaka. Questions 1, 2, 3, 4

Total number of responses was: 5 (Female) + 6 (Male) =11. All evaluators identified as Japanese. Age range 60 to 79 years.

Summary of the results on the main four evaluation questions:

1. *How specific is the story to the Japanese culture?*

Score	Frequency	Percentage (%)
8	2	18.18
7	2	18.18
5	4	36.36
4	1	9.09
3	2	18.18
	Total: 11	

2. *Were the robot's reactions appropriate to the person's culture?*

Score	Frequency	Percentage (%)
8	4	36.36
7	3	27.27
5	1	9.09
4	2	18.18
3	1	9.09
	Total: 11	

3. *Were the robot's reactions sensitive to the person's culture?*

Score	Frequency	Percentage (%)
10	1	9.09
9	1	9.09
8	3	27.27
7	1	9.09
6	1	9.09
5	3	27.27
3	1	9.09
	Total: 11	

4. *Did the robot assess the situation in an appropriate and acceptable way for the Japanese culture?*

Score	Frequency	Percentage (%)
8	4	36.36
6	3	27.27
5	2	18.18
4	1	9.09
3	1	9.09
	Total: 11	

## 5.8.4 Summary of Question 5 for all three cultures

All evaluators were asked to report on any displayed behaviours/feelings from the actors during their interaction with the robots. Following our triggers-cultural iceberg views on culture and our belief that sometimes cultural expressions are very subtle but a person with a similar cultural background will be able to understand them, we wanted to explore this hypothesis in this situation. Interestingly enough the evaluators had no trouble selecting different displayed behaviours/feelings across all cultures. Below is a summary of the selected responses (Table 6).

Table 6 Summary of answers to Question 5.

Q5: Behaviours / Feelings/ Values	English Total number of participants: 15	Indian Total number of participants: 17	Japanese Total number of participants: 11
Happiness	9	4	2
Enjoyment	6	7	4
Disappointment	7		
Sadness	4	4	
Frustration	3	1	
Patience	6	7	
Suffering		3	
Fear	1		
Compassion	8	3	6
Co-operation	9	9	7
Other	3	1	

These results demonstrated that the robot's programming which was based on the basic guidelines was (with only one exception- Japanese 36.36% response to Question 1) unique and specific as well as appropriate and sensitive to the chosen cultures, and that the robot was able to assess the situation depicted by the video story, in an appropriate and acceptable way. In addition, the evaluators were able to identify the cultural expressions of a number of feelings and values, which provided a positive indicator for the validation of the 'Cultural Iceberg' theory of triggers (Papadopoulos 2017).

## 6 Discussion on all findings and conclusions

In order to validate the basic guidelines that we developed and discussed in Deliverable D1.3, we designed and conducted an observation study and produced and evaluated videos in which amateur actors enacted encounters with the Pepper robot based on scenarios we had written. Figure 10 summarises the research activities undertaken in order to arrive where we are now: The production of **Deliverable D1.3: Refined guidelines for cultural competence encoded in the cultural knowledge base**.

In this deliverable we have presented the data collected and analysed from the research activities we have undertaken. We recognise that there were limitations which impacted on our ability to compare the similarities and differences between the three cultural groups. Deeper analysis is also required in order to fully understand and exploit all the accumulated data. The evidence we have presented goes some way to:

- prove that the guidelines we have produced are appropriate and sensitive to the chosen cultures and that following the ADORE model the robot will have the potential to assess and respond to encounters with people in its care, in culturally appropriate and acceptable ways.
- provide examples of both visible and subtle representations of the chosen cultures which can be used as exemplars to guide our attempts to avoid stereotyping people; this has been the key principle of the work conducted in WP1 and forms the foundation for the whole of the CARESSES project.
- validate our ‘Cultural Iceberg’ theory and hypothesis that the hidden/subconscious elements of our cultures when triggered can rise in the visible part of the iceberg and be subsequently demonstrated as culture-specific behaviours.
- suggest that individual behaviours are both the consequence of culture and structure. There is a link between some of the observed behaviours of the study participants to suggest that these may be the result of the way life and resources within the care homes are structured.

## Refinement of Guidelines Map

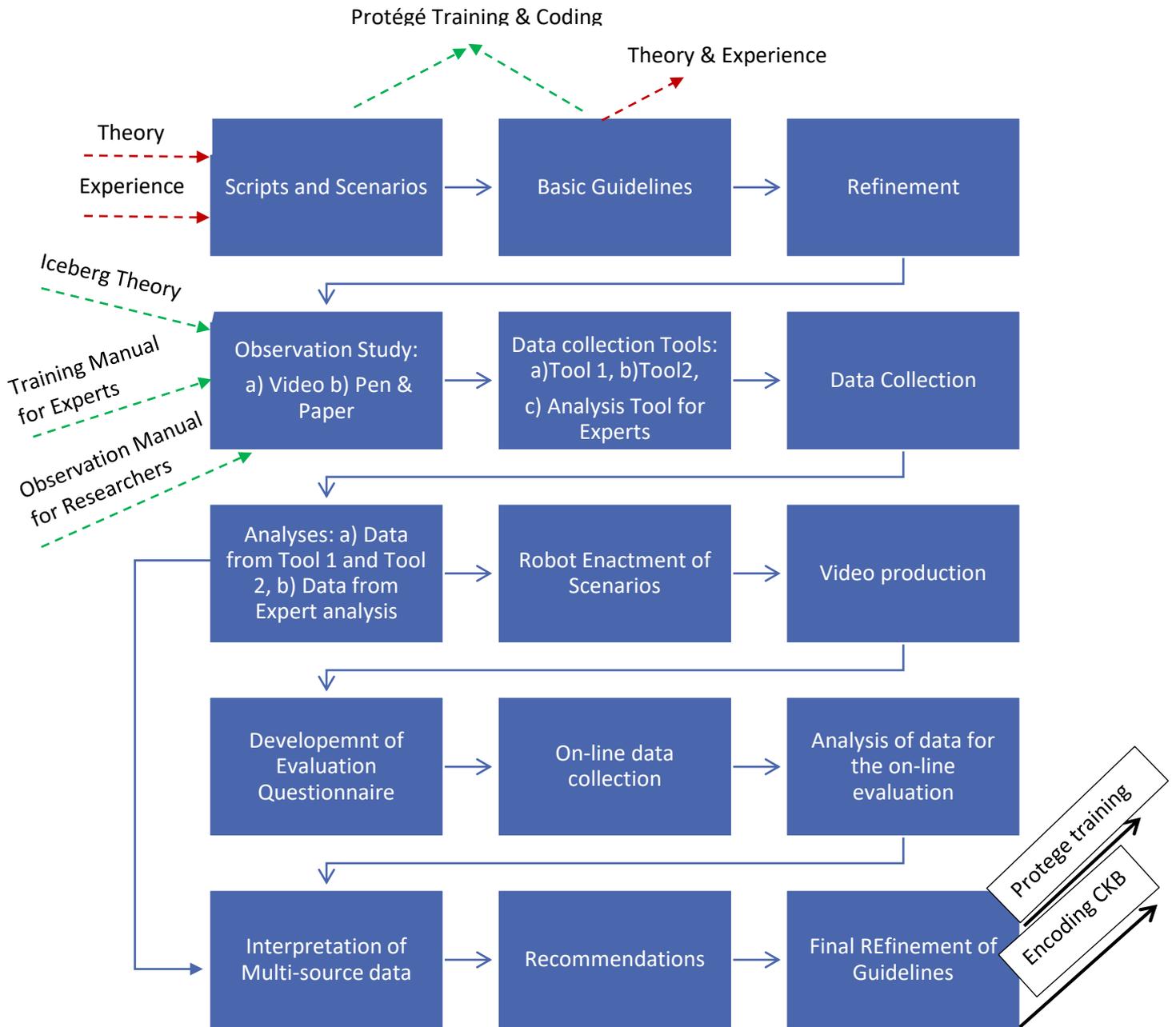


Figure 9 Summary of the research undertaken in WP1.

### 6.1 Reflections on methodology and findings

*Were our methods appropriate and effective?*

Our methods were guided by a strong theoretical framework which provided a ‘solid’ foundation to our investigation. The theory guided the development of the tools (Tool 1, Tool 2 and Analysis Tool that the experts used) and provided us with the necessary confidence that the acquired data are valid.

Using ‘paper and pen’ observations and experts viewing the video recordings provided the necessary triangulation of data (the ‘paper and pen’ observations have not been performed in Japan for reasons that have been explained in Section 3.1). It is well documented that the conduct of observations has inherent risks for biases. One must consider for example the role of the researchers, i.e., how the presence of the researchers in the field might influence people’s interactions and their reactions. In addition, the researchers need to be aware of their own heritage and experiences and be mindful of the fact that their own cultural lenses influence their interpretations. Our methods were appropriate in addressing these risks.

We visited multiple facilities. In the UK the 12 participants were recruited from four different facilities and both in the UK and Japan all participants were observed multiple times. In addition, researchers spend enough time on each facility developing a trusting relationship with participants and staff. They were always available to answer questions, they explained their role multiple times, they used appropriate and discreet ways during observations. The researchers kept reflective logs, debriefed after observation visits and discussed their interpretations.

Tools 1 and 2 were helpful in focusing our observations. Our eyes were “looking for” the participant’s reactions to simple everyday events. What was difficult was the task of “counting the frequency” of verbal or non-verbal communication codes in Tool 1 during the on-site observations. On reflection, the form could be simplified. It could be easier to capture the presence or absence of the behaviours and use more qualitative codes for the frequency and duration such as “never”/ “often” / “some of the time” / “most of the time” / “always”. On the other hand, using the forms as they currently are to code behaviours from a video recording is easier as the user can stop/start the recording.

Furthermore, the approach of capturing unstructured everyday snapshots was effective in providing long enough and rich enough video footage that led to the pool of smaller video clips that were viewed by the experts. Our experts did not have difficulties using the Analysis Tool and commented positively on the number of videos that they had to watch and stated that they found the task interesting and intriguing.

*Does what we learned enable us to identify and make the changes to the guidelines in a significant way? Or is it about adding and providing more details?*

Without overstating the findings, we believe that they provide enough evidence to confirm our hypothesis that cultural expressions can be very small and subtle but essential components of a person’s cultural identity and should not be overlooked. This is an area which demands further research.

The on-line evaluation of guidelines (Section 5, on-line videos of Pepper with amateur actors) provided additional evidence that the programming of the robot with the current guidelines was viewed as culturally appropriate and we can thus build on it.

Overall, we believe that our work on culturally competent guidelines for the programming of robots will shape future work on this field, especially as the robot’s capabilities expand. Current robots have limited capabilities to recognize and process human behaviours but we strongly believe that our work has provided the in depth understanding of the cultural influences on behaviour which are critical for the work on human-robot interaction.

## 6.2 Application of findings

Based on the research findings presented in this report we have reviewed the existing guidelines and have made a number some refinements to them as well as numerous additions: the whole set of guidelines is reported in Appendix 2.

More specifically we:

1. Explored how the information on triggers can be integrated into the guidelines.
2. We added 16 new topics of conversation.
3. We refined a number of the existing enactments of qualitative behaviours and added new guidelines on ‘silence’, the enactments of ‘friendship’, ‘respect’, ‘patience’, ‘sadness’, ‘pride’, ‘dignity’, and ‘co-operation’.
4. We refined a number of the existing guidelines about quantitative behaviours.
5. We mapped all the new guidelines across the concepts and sub-concepts of the scenarios and created and added new key codes. See Appendix 6.

The next Section details the process of encoding guidelines in the Cultural Knowledge Base developed in WP2 (Attachment 1 and 2)

## 7 Encoding Guidelines in the Cultural Knowledge Base

This section assumes that the reader is familiar with the internal structure of the CKB and associated Assessment & Adaptation algorithms that are the topic of Deliverables D2.1 and D2.2.

Encoding the ADORE model and the Guidelines for Culturally Competent Robot Behaviours (Deliverable D1.2 and D1.3) in the Cultural Knowledge Base (CKB) requires a deep mutual understanding and close cooperation between those responsible for collecting and producing the knowledge to be encoded and those responsible for building and managing the CKB. To this end, other projects facing similar tasks have recommended and discussed the efficacy of “knowledge transfer” meetings (Ribes et al., 2009), in which researchers and experts of one field illustrate foundations and challenges or their research domain to the those of the other, to build a common ground and vocabulary, and they all work together, with frequent feedback loops, to identify (i) what should be encoded and (ii) how.

As outlined in Figure 10, the workflow adopted within CARESSES to produce and encode the ADORE model and the Guidelines in the CKB follows the above principles.

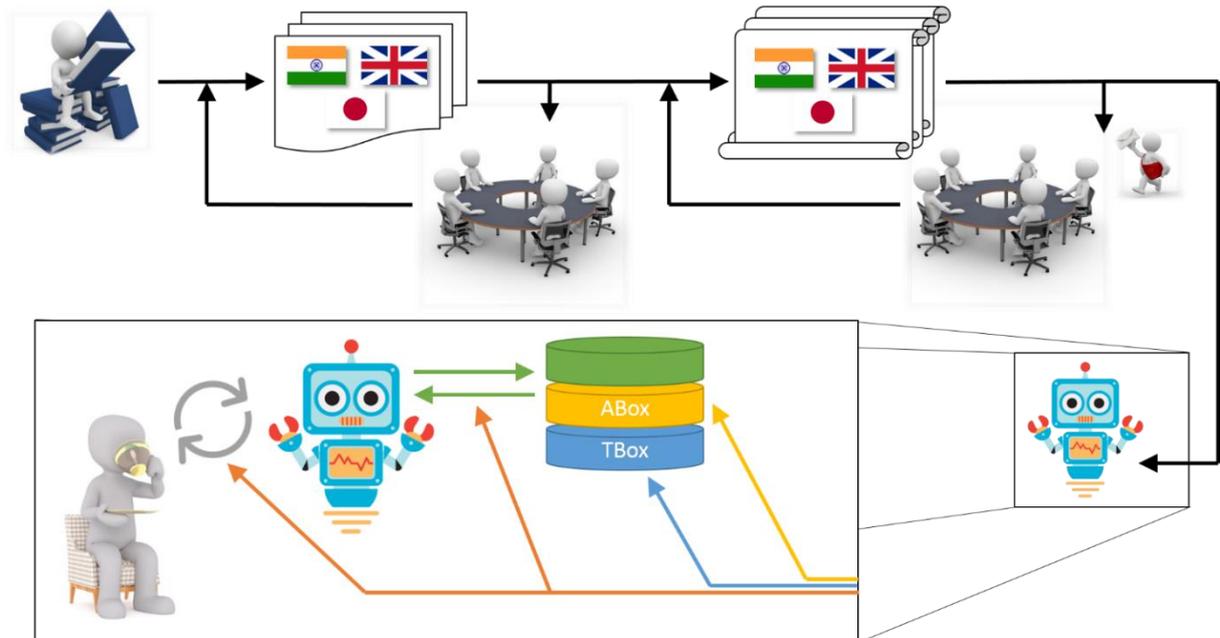


Figure 10. The workflow (denoted with black arrows) adopted to devise, refine, and encode in the robot the guidelines. The zoom box highlights the portion of the process specifically referring to the encoding of the Guidelines in the CKB. Culture-specific information present in the guidelines is mapped onto the TBox (in blue) and ABox (in yellow) of the ontology inside the CKB, and used by algorithms and structures for runtime Assessment & Adaptation to the user’s preferences (in green). The ADORE model (in orange) influences both such algorithms and directly the way in which the robot interacts with the user (in grey).

As a first step, reported in Deliverable D1.1, a number of “scenario tables” have been developed, describing a daily routine or situation and indicating the robotic capabilities needed to assist the older person in that case, in a culturally appropriate, sensitive and acceptable way. Convergence to suitable and feasible robotic capabilities (ideally, implementable on an off-the-shelf robot platform, possibly

operating in a smart ICT environment) is achieved by iterative revisions incorporating feedback from roboticists and Transcultural Nursing researchers.

A first set of guidelines, presented in Deliverable D1.2, was then extracted by the researchers in Transcultural Nursing (WP1) from the scenario tables, as a corpus of information and rules aimed at mapping the notion of cultural competence onto the data structures and algorithms defining the robot's behaviour. The iterative refinement of such guidelines, integrating feedback from independent experts, observations in care homes, Transcultural Nursing and robotics researchers, discussed in this deliverable, produced the corpus of refined guidelines that will drive the robot's behaviour during the final experiments.

As the above sections of this deliverable detail, the knowledge to be encoded in the CKB includes two types of guidelines: (i) information and rules describing the influence of one or more cultures on the robot's behaviour, that can be encoded in the robot offline and revised online (henceforth referred to as the guidelines); (ii) design principles and requirements for the procedures used by the robot online to revise its knowledge and adapt to the user (the ADORE model).

Section 7.1 describes the implementation of the ADORE model in the algorithms and modules driving the robot's behaviour, while Section 7.2 details the procedure adopted to encode the guidelines in the ontology inside the CKB, specifically focusing on the structure and therefore the TBox of the ontology. The encoding of culture-specific knowledge in the ABox, which saw the direct involvement of non-technical partners, is discussed in Section 7.3 and 7.4.

## 7.1 Implementing ADORE

Following the release of Deliverable D1.2, researchers aimed at mapping the ADORE model in the behaviour of the system as follows

- A: the robot Assesses the cultural group and personal preferences of the person
- D: the robot Does something/execute an action to achieve a goal/activity, or simply to talk around a topic of conversation
- O: the robot Observes the person, or it just ask a question
- R: the robot Revises what it knows about the person
- E: the robot Evaluates/verifies what it has done.

Table 7 summarizes how the ADORE model has been embedded in the architecture and algorithms of CARESSES. As the Table reports, some steps only involve the cultural knowledge inside the CKB and are implemented by data structures and algorithms inside it, discussed in details in Deliverables D2.1 and D2.2. More specifically, steps "A" and "R" are tightly related to the likeliness associated with each instance in the ABox, and the Assessment & Adaptation algorithms and Bayesian Network that operate on top of the ontology. Step "E", instead, refers to reasoning mechanisms (for example, based on SWRL rules) which exploit other properties of ABox instances. Such mechanisms are preliminarily discussed in Deliverable D2.2.

Step "D" corresponds to the culturally sensitive planning and execution of actions and it involves all main software components in CARESSES: appropriate actions and parameters are selected by the CKB on the basis of available knowledge about the user, and organized and timed by the Culturally-Sensitive Planning and Execution Module (CSPPEM) to satisfy active goals and constraints. The Executor, residing within the Culture-Aware Human-Robot Interaction Module (CAHRIM), is the

software responsible for the actual execution of the actions and their monitoring up to completion (or failure), which triggers the selection of another action to execute.

Table 7. Implementation of the ADORE model in CARESSES.

	<b>Description</b>	<b>Implementation</b>
<i>A (assess)</i>	<p><i>Assess with <u>Cultural Knowledge and Sensitivity</u>.</i></p> <p>The robot Assesses the cultural group and personal preferences of the person. Determine the robot's behaviour based on its current knowledge of the assisted person.</p>	[CKB] Identify, among the currently active ABox instances (both culture-specific and user-specific) those with highest likeliness for each category (e.g., what speed should the robot move at? What conversation topic should it suggest?).
<i>D (do)</i>	<p><i>Do with <u>Dignity and Cultural Compassion</u>.</i></p> <p>The robot Does something/execute an action to achieve a goal/activity, or simply to talk around a topic of conversation Considering current robot's objectives, act upon the knowledge assessed at the previous step.</p>	[CKB→CSPEM→CAHRIM] Execute the action(s) required to achieve the current goal, in the variant and with the parameters selected by the CKB as the most likely to be valid for the assisted person (i.e., having highest likeliness among equivalent options, e.g., a food-related conversation topic instead of a sports-related one, slow speed rather than fast).
<i>O (observe)</i>	<p><i>Observe with <u>Cultural Awareness at Conscious (visible) and Subconscious (invisible) levels</u></i></p> <p>The robot Observes the person, or it just ask a question. Acquire feedback from the person about the action performed by the robot at the previous step.</p>	[CAHRIM→CKB] Infer the person's likeliness concerning one or more instances related to the action executed by the robot, by analyzing available sensory data (e.g., a verbal utterance captured by the robot's microphones, a gesture captured by the robot's cameras).
<i>R (revise)</i>	<p><i>Revise in <u>Partnership with Client</u></i></p> <p>The robot its knowledge about the assisted person, on the basis of the feedback acquired at the previous step.</p>	[CKB] Update the likeliness of the ABox instance(s) related to the analysis performed at the previous step and propagate the effects of the change onto interconnected instances (by relying on the Bayesian Network associated with the ontology).
<i>E (evaluate)</i>	<p><i>Evaluate with <u>Cultural and Robotic Competence through the application of Ethical Principles</u>.</i></p> <p>The robot Evaluates/verifies what it has done. Determine, based on the revision performed at the previous step, the current context and possible direct feedback from the user, what knowledge the robot should currently consider for interacting with the assisted person.</p>	[CKB] Identify the portions of the CKB that are currently active, by taking into account contextual constraints (e.g., some topics of conversation might be disabled at some times of the day; parameters such as volume might be set to a given value under specific circumstances, independently from the person's preferred volume). Such constraints are defined over property values of instances in the ontology, and do not affect the likeliness.

Similarly, step “O” involves two CARESSES components: CAHRIM and the CKB. The sensory system managed by CAHRIM continuously acquires and processes information (acquired through sensors or through verbal interaction), to update the robot’s knowledge about the context and the status of the user. Short-term information (such as the person’s current location within the house) is only sent to CSPEM for planning purposes, while long-term information (such as the person’s preferences concerning the robot’s volume, a reminder for next Thursday’s visit to the doctor, or her preferences concerning clothes) are sent to the CKB and converted in likeliness values for related user-specific ABox instances.

## 7.2 Defining the structure of the CKB

Adopting an approach similar to the one presented in (Ribes et al., 2009), computer scientists and experts in transcultural nursing have worked in close cooperation and with fast iteration loops to encode the knowledge of the Guidelines in the form of an ontology. Although there is (and can) not be a clear, universal procedure for the encoding of knowledge in an ontology, the Literature provides a number of best practices (Noy et al., 2001; Devedzić 2001; Larsen et al., 2017), typically aiming at ensuring that effective validation moments are inserted within the design process (Gordon and Weng 2015), making the best out of existing ontologies and resources for knowledge representation (Suárez-Figueroa et al., 2012), as well as available tools supporting ontology design and maintenance (Gyrard et al., 2015).

In line with the procedure outlined by Noy et al (2001) (steps 1 and 2), computer scientists involved in CARESSES started drafting the structure of the ontology on the basis of the scenario tables and the basic guidelines, categorizing the information therein in macro-areas of knowledge (e.g., food, habits, robot actions...). This categorization allowed for a preliminary structuring of the knowledge, as well as the search and identification of existing ontologies and knowledge representation structures which are relevant for our application and therefore worth merging/embedding in the CKB. As part of this step, as described in Deliverable D2.1, we also identified a suitable upper ontology to associate the CARESSES ontology with, to simplify its later publication, expansion and reuse.

The third and fourth steps in the design procedure outlined by Noy et al (2001) require to enumerate the important terms in the ontology and, consequently, define the classes of the ontology and their hierarchy. In CARESSES, we have identified a preliminary corpus of important terms by analyzing all nouns and verbs in the scenario tables and basic guidelines, and checking (with iterative revisions involving computer scientists as well as Transcultural Nursing experts) if they constitute a class of the ontology and what is their relation with other relevant terms.

Two approaches exist to define the hierarchy of classes: the top-down approach starts with the definition of the most general concepts in the domain and subsequent specialization of the concepts, while the bottom-up approach starts with the definition of the most specific classes, the leaves of the hierarchy, with subsequent grouping of these classes into more general concepts. In CARESSES, we have followed a combination of the two approaches, selecting the most appropriate one for each term of relevance identified at the previous step. For example, recreational activities to engage in in the afternoon are discussed in the scenario tables and guidelines via a general description and a few examples, thus requiring a top-down approach. Conversely, appropriate values for the robot actions’ parameters are analysed individually: in this case, we adopted a bottom-up approach to define how to properly link them to top concepts.

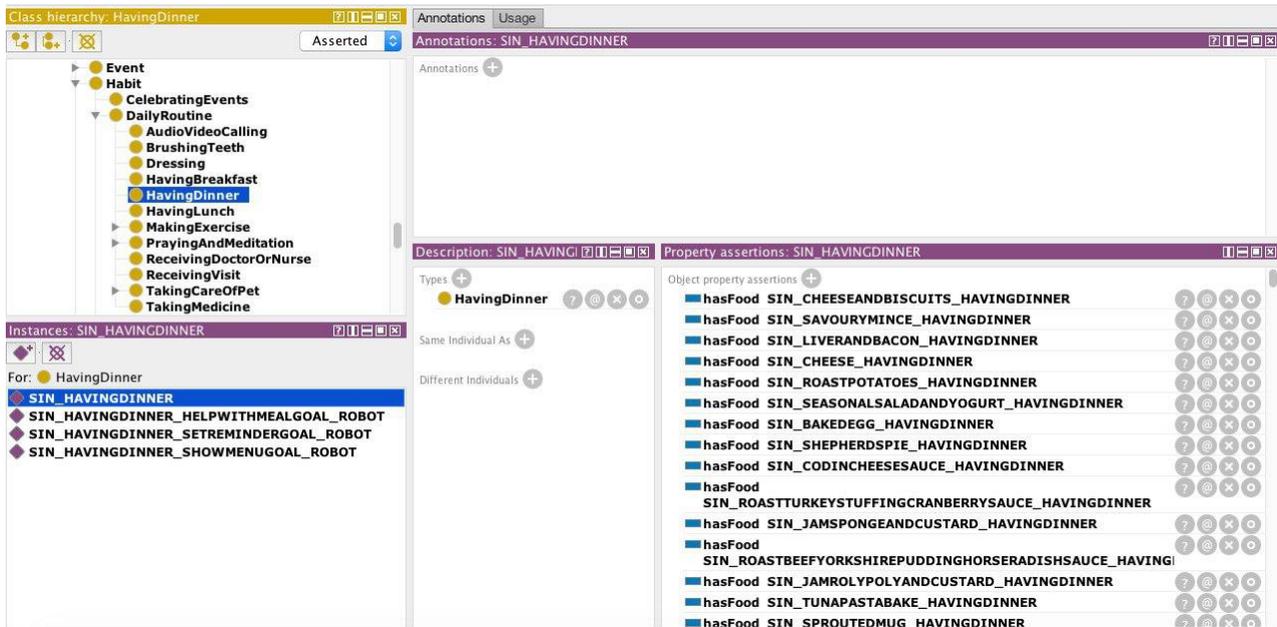


Figure 11. A portion of the CARESSES ontology, detailing Dinner habits for the Indian culture. The top-left box reports the class hierarchy of the concept “HavingDinner”, while the bottom-left box lists currently available instances of “HavingDinner”. The “IN” prefix to all instances specifies that they all refer to the culture-specific Indian culture, while the suffix “ROBOT” denotes that some of such instances are related to actions that the robot can do when the concept “HavingDinner” is active. The right box lists some of the property assertions linking instances of “HavingDinner” to instances of other classes. In particular, a number of assertions of the “hasFood” property (which is derived from “hasTopic”) link “HavingDinner” to different types of food.

The subsequent step in the definition of the ontology is the definition of the properties of each class. As described in details in Deliverable D2.1, in CARESSES, the CKB has the double objective of storing cultural knowledge of relevance and allowing the robot to verbally discuss it with the user, in a culturally competent manner. The structure of the ontology reflects and implements this double purpose, specifically by means of three key features:

- the likeliness property, describing how likely it is that the concept holds true for a person belonging to a given culture;
- the top class Topic, with its properties question, positive\_sentence and negative\_sentence, which allows the robot to talk in a rich and appropriate way about all concepts in the ontology that are derived from Topic;
- the extrinsic (object) property hasTopic (and derivate properties) that connects a Topic-derived concept to another and allows for specifying the context in which the sentences stored in the properties question, positive\_sentence and negative\_sentence are valid.

The last step in the design of an ontology is the creation of instances to fill the ABox. A crucial element of the scenario tables and the guidelines is the link between each piece of culturally competent information and the one or more cultural groups it refers to. As detailed in Deliverable D2.1, we have defined a naming convention for ABox instances which allows for specifying the cultural group the instance is associated with. In particular, the ABox instances of class “User” which refer to culture-specific information are named following the convention:

GEN\_[ISO 3166-1 country\_code]

Which in our case produces GEN\_GB, GEN\_IN, GEN\_JP, for, respectively, the British, Indian and Japanese culture. All other culture-specific ABox instances are then named to include both the culture they refer to (via the ISO 3166-1 country code) and the concept they relate to via the `hasTopic` property (for example to allow the robot to discriminate, and appropriately discuss, the tea that British people may have during the afternoon, from the tea that they might want at breakfast). Figure 11 provides an example of the encoding of the above concepts in the case of class `HavingDinner` and its culture-specific instances related to the Indian culture, while Figure 12 shows how the likeliness and dialogue-related sentences are embedded in the ontology as intrinsic (data) properties.

The screenshot displays the Protege ontology editor interface. On the left, a class hierarchy for `DiwaliFestival` is shown, including properties like `Name`, `Nickname`, `Event`, and `ReligiousCulturalEvent`. The main area shows the details for the instance `SIN_DIWALIFESTIVAL_CELEBRATINGEVENTS`. The 'Property assertions' section lists several object properties, and the 'Data property assertions' section lists several data properties with their values.

Property	Value
<code>hasKeyword1</code>	"diwali"@en
<code>hasQuestion</code>	"Is Diwali one of your favorite festivals?"@en
<code>hasPositiveAndWait</code>	"I know that Diwali is the festival of lights. Please tell me some of your favourite stories about the Diwali festival."@en
<code>hasLikelihood</code>	0.9
<code>hasName</code>	"the Diwali festival"@en
<code>hasName</code>	"I Diwali festival"@it
<code>hasPositiveSentence</code>	"I understand"@en
<code>hasQuestion</code>	"general question?"@en
<code>hasSentence</code>	"I will remember that"@en
<code>hasSentence</code>	"general question?"@en
<code>hasSentence</code>	"I know that Diwali is the festival of lights. Please tell me some of your favourite stories about the Diwali festival"@en

Figure 12. Details of data property values of the culture-specific instance “`DiwaliFestival`” for the Indian culture. As shown in the box on the right, the likeliness of this instance is 0.9, meaning that it is highly likely that an Indian person celebrates the Diwali festival. The listed keywords are used to define the conversation contexts in which it is appropriate to discuss this topic (i.e., when discussing holidays and celebrations), and the “`hasQuestion`” and “`hasPositiveAndWait`” properties define sentences that the robot can use to talk about the festival in a culturally competent manner.

Lastly, a person-specific instance of `User` is named with the name of the user and linked to the relevant culture-specific instance via the `hasSpecific` property. For example, the scenario tables suggest that GEN\_GB is linked via `hasSpecific` to the instance DOROTHY\_SMITH. Similarly, each person-specific instance is linked to the underlying, associated culture-specific instance via the `hasSpecific` property. This link is exploited by the Assessment & Adaptation algorithms to implement the “A” and “R” steps of the ADORE model, which define the relation between culture-specific and person-specific instances.

The structure and above discussed key elements of the CARESSES ontology have been designed, revised and refined iteratively and jointly by computer scientists and researchers in Transcultural Nursing, and preliminarily evaluated as described in Deliverables D2.1 and D2.2.

### 7.3 Training course

The creation of ABox instances, and especially the filling of key properties such as *likeliness*, *question*, *positive\_sentence* and *negative\_sentence*, has been done jointly by computer scientists and researchers in Transcultural Nursing, to ensure the cultural competence of the knowledge stored in the CKB. To allow researchers with no expertise in ontology and knowledge representation to work with the CARESSES ontology, a number of initiatives and tools have been devised:

- A tutorial with a simplified version of the CARESSES ontology, with guided exercises to help familiarize with ontologies and the peculiar features of the CKB;
- A software for the simulation of user-robot dialogues using the sentences stored in the data properties of the CKB instances, to ease the insertion and checking of the sentences;
- A two-days training course (that took place on May 3-4, in the UK) for the researchers from MU and BEDS, held by a researcher from UNIGE and with the purpose of defining procedures for the evaluation and revision of the knowledge stored in the CKB, to assess its cultural appropriateness;
- A series of video-tutorial, with a researcher going through the aforementioned exercises commenting his actions, for the researchers from NAGOYA and JAIST and later made publicly available to all research partners on the project repository.

The training material and procedures will be defined in greater details in Deliverable D2.3, dealing explicitly with Cultural knowledge acquisition and updating according to the DoA.

### 7.4 Encoding refined guidelines in the CKB

The process of encoding the final set of guidelines in the CKB has started and it will be completed in the next months, before October 2018: the current version of the CKB is attached to this deliverable.

As described before the MU team was trained by the UNIGE team on the ontology architecture in Protégé. Even though the MU was not responsible for Protégé, it was deemed necessary to understand how the guidelines are translated into the ontology as topics, instances, individuals, *likeliness*, *negative* and *positive* questions and so on.

The MU team mainly focused on writing culturally relevant responses into the system. For each cultural group a cultural – generic instance has been created. In each instance and for each topic possible answers to a user’s positive or negative answers were added.

Among data properties, possible main key questions were added (data property *hasQuestion*). These were usually questions that the robot can ask the user about the particular topic and most probably will lead to a “yes/no” answer (closed-ended questions). In the event that the user answers “no” to that main question, a culturally relevant answer was added (data property *hasNegative*). These answers tended to be generic and provide room for the robot to possibly ask another question or the user to move on with conversation. In the event of a positive answer from the user, we added statements for the robot to reply (data property *hasPositive*). These statements were very important because they had to reflect the robot’s cultural knowledge, sensitivity and competence and ADORE framework. Therefore they were mainly open ended questions. In addition, statements were added under the *hasPositiveAndWait* data property, giving the opportunity for the robot to continue engaging the user in conversation but above all providing the user with the opportunity to talk and share.

Finally, a proper likeliness score was proposed for all instances, in order to guide the robot's initiation of discussion on a particular topic based on the user cultural group.

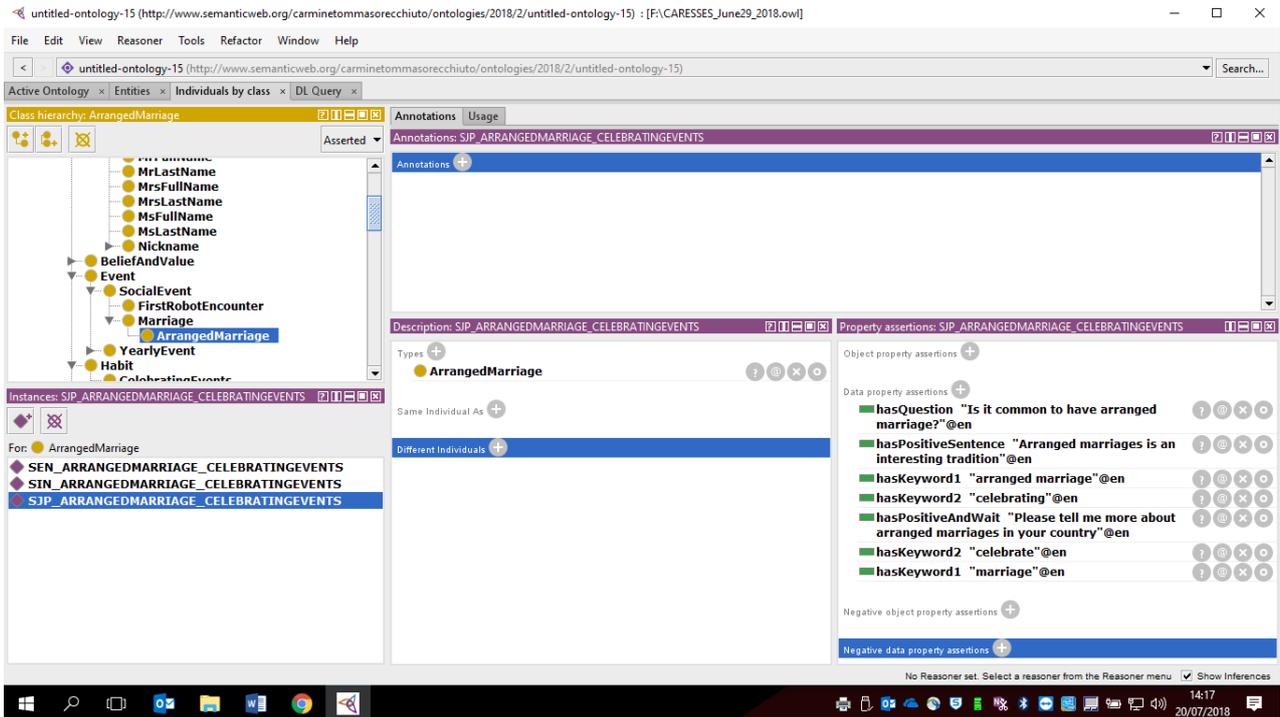


Figure 13. A portion of the CARESSES ontology, detailing the custom of arranged marriages for the Indian culture.

## 8. How to

The various sections of this deliverable provide detailed description of the processes and methods, tools, structures and frameworks used in order to refine the basic guidelines, encode and implement them.

Deliverable D1.3 will be used in technological Work Packages WP2, WP3, WP4 and WP5 in order to fill the Cultural Knowledge Base with the required knowledge for the robot to exhibit a culturally-competent behaviour, and will constitute the basis for setting up and testing the behaviour of the system with real-users in WP6.

## 9. Conclusions

### 9.1 Compliance with the DoA and corrective actions

According to the Description of Action (DoA), deliverable D1.3 is:

*the main output of Task 1.3 and 1.4. It consists in a formal, machine processable, representation of the cultural knowledge acquired in WP1, using the software tools for knowledge representations that have been developed in WP2, in order to make such knowledge available as an input to the assistive system.*

The work reported in this document and its attachments complies with the plans in the DoA. However, it should be noticed that the process of encoding the refined guidelines in the CKB has started but not ended, and will be completed in the next months, before October 2018, with the support of technical partners. The current version of the CKB is attached to this deliverable.

## 9.2 Achievements

Deliverable D9.1 has undertaken a process towards the development of guidelines for robots to exhibit a culturally competent behaviour. Along this process, the following results have been achieved:

- Observational study with 6 English, 6 Indian, and 5 Japanese participants (this includes the development of Tools 1 and 2, the observation manual and video recordings);
- Analysis of video recordings by experts (this includes the development of the analysis tool and the training manual for experts);
- Videos showing encounters with robots and actors, and online questionnaires submitted to recruited volunteers;
- Analysis of all the data acquired (including expert evaluation and questionnaires) and delivery of an updated set of guidelines (Appendix 2);
- Encoding of guidelines in the CARESSES CKB as an OWL2 Ontology.

## 9.3 Next steps

There are no more steps to be completed in this WP, as the WP ends at month 19. The process of encoding the refined guidelines has started, and will be continued in the following months with the support of technical partners.

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## 11. Appendices

Appendix 1 OBSERVATION STUDY AND EXPERT EVALUATION

Appendix 2 REFINED GUIDELINES FOR THE DEVELOPMENT OF CULTURALLY COMPETENT ROBOTS

Appendix 3 MEALS (LUNCH/DINNER)

Appendix 4 ACTIVITIES

Appendix 5 GAMES

Appendix 6 HOME AND FAMILY STRUCTURES

Appendix 7 MAPPING THE SCENARIOS TO GUIDELINES

## Appendix 1

### OBSERVATION STUDY AND EXPERT EVALUATION

#### A1.1 Visible presentations of culture resulting from the video analyses of Japanese experts

**Language.** All participants use Japanese.

**Dressing.** All participants are wearing western clothes, and no one is wearing kimono.

**Music.** In the afternoon activities, they sometimes sing Japanese nursery rhymes. Volunteer organizations once visited the facility and they were dancing while singing Japanese folk songs.

**Food.** They are always eating Japanese food with chopsticks and sometimes spoons. They eat white rice (sometimes porridge), laver, sprinkle, fish and vegetable simmered. Those who have weak swallowing function are given another meal and help the caregiver eat.

**Drinks.** Drinks are tea, such as green tea or barley tea. They did not drink juice or English tea. There were some elderly people preparing bottles for their own drinking water.

**Decorations (room).** On the wall, works decorated with cherry blossoms and pieces drawn by cutting finely cut colored paper and sticking them on the backing are decorated. It seems that these were created by elderly of the facility. The face of a man who is shrinking his mouth "Hyotoko" has been considered an lucky for a long time, and it is decorated. From the decoration of cherry blossoms, it seems to change the decoration of the wall according to the season.

**Activities / games.** Almost every day, they sit on a chair and exercise all together. One instructor is in front of all and tells them how to move their body. Sometimes exercising by group of several people, exercise using exercise equipment, and receiving guidance from physical therapists. These exercises will be held in the morning. In the afternoon, they sing songs and do riddle with some people. Some elderly people are listening to songs of their favorite singer with an iPad. Only once, a caregiver arranged desks to make a table tennis table, and male elderly played table tennis with a caregiver. Unless there is a special event (volunteer dance show) in the afternoon time, each elderly can just sit and spend time without doing anything, play hobbies (copying newspapers on notes), walk around with a walker, look out the window, watch TV, talk with friends, and do different actions. As a caregiver is very busy, they talk with the elderly while doing work of attaching records.

**Jewelry.** They do not have many accessories. Perhaps there is a rule of nursing care facilities that accessories can not be attached for safety.

**Festivals.** Only once, volunteer group came and sang and danced folk songs. However, it can not be said that it is a special festival.

**Customs.** They always use a wet towel when they eat. Sometimes, elderly people wipe their face with wet wipe. When eating a meal, they do not eat one dish at a time, but eat evenly on all the dishes ("eat triangularly"). When eating, they have a bowl dish with their hand and eat it with a mouth on it, but in Japan this is not rude. Both hands are always on the table and they will not eat with one hand (this is rude). Before eating and after finishing eating, they put both hands together and say "Itadakimasu" and "Gotisousama". After eating, they often pile up dishes. This is also a sign of having finished eating, meaning to try to help anyone who cleans up even a little. When a caregiver hands

over or collects a tray, some of them lower heads and say “Thank you.” After all the gymnastics are over, they sit on a chair and bow to the instructor. The instructor also take a bow to them. TV is on all day, but in the evening they watch sumo wrestling on TV. At the wrestler’s game who is expected as the winner of the season, the voice will rise as the game is decided.

## A1.2 Raw data from ‘pen and paper’ observations using Tool 1 (UK only)

Please remember that ‘pen and paper’ observations have not been performed in Japan, as explained in Section 3.1.

Table 8. Data from Tool 1

	Demographics of participants	Verbal Communication	Non-Verbal communication	Other
ID07	English/Female/83 /Morning/With Pet guinea pig	Social/Lifestyle and feeling/ Laughter Taking turns	Eye contact Smiling	
ID06	English/Female/88/ Afternoon activities /Tea Time	Social Laughter (most of the time) Use of humour	Eye contact Smiling	
ID06	English/Female/88/After Lunch / sitting in the lounge talking	Social Laughter Taking turns	Eye contact Body posture (lining forward some of the time)	
ID06	English/Female/88/ Lunch time /	Social (talks about her daughter , she has knee problems and arthritis, walks with a walking aid, very polite)	Eye contact Smiling No use of any gestures	
ID05	English/Female/88/after lunch/afternoon activities	Laughter Use of humour	Eye contact Use of gestures (during the games)	
ID05	English/Female/88/Morning tea	Social Laughter (most of the time) appropriate Use of humour (most of the time)	Eye contact Smiling Use of gestures (some)	Language Dressing (nice bracelet, nicely done nails)
ID04	English/Male/83/morning breakfast and lunch time	Taking turns Laughter Use of humour (some of the time)	Eye contact Smiling Use of gestures (most of the time)	Language Dressing (t-shirt and shorts)

ID04	English/Male/83/lunch time Lively, likes to joke and his nickname is 'foxy' Due to tracheostomy prefers to write and whispers. He considers himself a proper Englishman going back to 1300s. He likes to eat alone and be helpful to the staff	Instructions Laughter Use of humour (quite often)	Eye contact Smiling Head nodding Use of gestures (quite often, funny)	Photos of his father from the army (1924), his third wife, cards, newspapers in the room and teddy bears (little foxes)
ID02	English/Male/79/tea time afternoon	Social (some of the time) polite Tone of voice (soft) Silence	Eye contact (occasionally)	
ID02	English/Male/79/after lunch game of bingo	Social (some of the time) Lifestyle/feeling Tone of voice (soft) Silence	Eye contact Body posture (sitting, bending to look bingo card/attentive) Personal space (sitting in chairs)	
ID02	English/Male/79/lunch time	Social Tone of voice (soft) Silence	Body posture (sitting)	
ID02	English/Male/79	Social (once) Tone of voice (soft) Silence (all of the time)	Body posture (sitting)	
ID02	English/Male/79/ after lunch	Taking turns Tone of voice (soft) No use of humour (did not laugh with the joke) Silence	Eye contact	
ID02	English/Male/79/Morning breakfast and mid-morning routine and lunch time	Social (some of the time) Health/Nursing (once) Taking turns Tone of voice (soft) Silence	Eye contact (limited/ more later during play and when talked to staff and other residents) Smiling (once or twice)	
ID01	English/Female/after lunch/early afternoon /games in the garden	Laughter (most of the time) Tone of voice (soft)	Eye contact (most of the time) Smiling	

ID01	English/Female/morning breakfast and midmorning routines and lunch time	Tone of voice (soft) Silence	Eye contact (some)	
ID01	English/Female/afternoon tea time	Laughter (once) Tone of voice (soft) Silence	Eye contact (some of the time) Smiling (some of the time) Body posture (sitting) Personal space (sitting in, side by side in chairs)	
ID01	English/Female/after lunch game of bingo	Social Tone of voice (soft) Silence	Body posture (sitting, looking at card) Personal space (sitting side by side)	
ID01	English/Female/93/lunch time	Social (a couple of times) soft Tone of voice (soft) Silence	Eye contact (once) Head nodding Personal space (close)	
ID01	English/Female/93/lunch time	Social (some of the time) Tone of voice (soft) Silence (most of the time)	Eye contact (once) Body posture (sitting) Head nodding (once) Personal space (close)	
ID08	Indian/Male/65/after lunch	Tone of voice (soft quite) Use of humour (occasionally) Silence (most of the time)	Body posture (reserved) Use of gestures (just a few)	Language (English and Gujarathi) Dressing (t-shirt and trouser) Rakri (red thread) tied at hand. Rakri was given to him from his sisters wishing him good health. Each sister gave him one and he likes to wear all three. 'He says

				others keep them for a little bit and then take them off but I like to wear it until it breaks’.
ID09	Indian/Female/79/after lunch	Social Lifestyle/Feeling Taking turns Laughter (sometimes) Tone of voice (soft) Silence (when others were talking)	Eye contact (all of the time) Smiling (most of the time) Use of gestures (just a few hand gestures)	Language (English and Gujrathi) Dressing (blouse and skirt) 2 bangles on her right hand  Photo in the room of daughter’s family
ID08	Indian/Male/65/afternoon activity game of chess	Silence	Body posture (focusing on the game, placing hand on head)	Language (English with the carer)
ID08	Indian/Male/65/midmorning exercise	Social Silence Tone of voice (soft)	Eye Contact Smiling (sometimes)	
ID010	Indian/Female/70/lunch time	Silence	Eye contact	Language (more fluent in Gujrathi)
ID09	Indian/Female/79/mid-morning	Silence	Eye Contact Smiling (occasionally) Use of gestures (doing namaste)	Language (English and Gujrathi) Dressing (robe over her nighty) Bangles on her hand Use of dandiyas for exercise in the temple
ID08	Indian/Male/65/mid-morning	Social (sometimes) Silence	Eye contact Smiling	Language (English and Gujrathi) Dressing (t-shirt and trouser)  Use of dandiyas for exercise in the temple
ID010	Indian/Female/70/mid morning	Social (occasionally) Tone of voice (soft)	Eye contact Smiling	Language (more fluent in Gujrathi)

		Silence		Dressing (blouse and skirt) Bangles and earrings
ID010	Indian/Female/70/mid-morning- first day of festival	Social (occasionally) Tone of voice (soft) Silence	Eye contact Smiling	Language (more fluent in Gujrathi) Dressing (blouse and skirt) Bangles and earrings  Commented on the colour of my blouse that she said is a 'peacock' colour.
ID011	Indian/Female/73/mid-morning dressing	Social Taking turns Tone of voice (soft)	Eye contact Smiling Use of gestures (a few)	Language (English with a few Bengali words) Dressing (sari) Bangles and earrings
ID012	Indian/Female/around 60/afternoon/pray	Social Taking turns Tone of voice (soft)	Eye contact Smiling Use of gestures (a few)	Language (English, Hindi) Dressing (sari) Bangles, earrings and necklace  Chanting
ID013	Indian/Male/around 65/ afternoon/pray	Social Taking turns Tone of voice (soft)	Eye contact Smiling Use of gestures (a few)	Language (English, Hindi) Dressing (Punjabi and trouser)  Chanting
ID012	Indian/Female/around 60/afternoon/Meditation	Social Taking turns Tone of voice (soft) Silence	Eye contact Smiling Use of gestures (quite a few)	Language (English, Hindi) Dressing (sari) Bangles, earrings and necklace  Chanting during meditation and then staying silent for a few minutes.

				Sitting on the floor
ID01 3	Indian/Male/around 65/ afternoon/meditation	Social Taking turns Tone of voice (soft) Silence	Eye contact Smiling Use of gestures (a few)	Language (English, Hindi) Dressing (Punjabi and trouser)  Chanting during meditation. Sitting on the floor next to his wife

## A1.3 Expert Tables

In the following Tables filled by experts, we used a colour coded method to identify patterns. We used *green* for phrases describing **triggers** and then we coded these phrases into categories. We then looked in the **behaviours which** expressed the beliefs, values, feelings perceptions etc., which inhabited the subconsciousness of the individual, and used *red* to code the patterns of these expressions as recorded by the experts.

### A1.3.1 Indian Experts

Table 9. **Common Video 1: 'Indian couple\_6 mins'**. In this video an Indian **lady** and her husband are talking with the researcher. The Indian lady is in bed and in the care home for rehabilitation. Her husband is sitting next to her in an arm chair.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Compassion	The couple <i>were discussing</i> their life in a loving, respecting way exhibiting appreciation of each other	The way they were <i>complimenting their</i> story
	Sadness	There was a sadness in their story	The <i>reasons why they had to emigrate etc (memories)</i>
	Hope and courage	<i>In their outlook</i> for their children	The story telling and communicating. They enjoy companionship and human connection.
<b>Expert 2</b>	Pride	-Gentleman <i>explaining detailed events</i> and dates, minute details -Social eye-gaze maintained -animated gestures -smiling	<i>Describing his struggle and hardships(memories)</i>
	Annoyance/boredom	- <i>closing eyes/fixed stare to floor/looking away</i> - <i>dozing off</i>	Might be continuous talk by partner ( <i>boring topic</i> )
	Co-operation	- <i>nodding</i> to partner's statements -adding details together	
	Interest	-smiling, laughter - <i>nodding</i> in acknowledgement	A <i>fond memory</i> 'Gandhi moment' ( <i>memories</i> )

Table 10. **Common Video 2:** 'Indian **lady** Temple\_ 4mins'. In this video an Indian lady is participating in festivities in the Temple of the nursing home.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Pensive: she is pensive on her own.	She tends to have an expression indicating this	She goes along <b>with the ceremony</b> with this feeling ( <i>festival/custom</i> )
	Likes to be engaged. She becomes active when engaged by others	She <b>smiles and greets</b> when others say Namaste. She is very active during doing aarti by herself.	Human engagement and people speaking or engaging with her
	Musically involved. She does the talam (beats) with music	She <b>claps her hand</b> along with the beat	The <b>music</b> makes her clap her hands. The environment made her active ( <i>festival/custom</i> )
	She loves her religious customs	She was <b>actively participating</b> in the aarti etc	Her comfort with the <b>tradition</b> ( <i>festival/custom</i> )
	She feels very secure in the group	She was <b>engaging</b> with the priest as he was asking questions at the end. She was <b>responding</b> as an <b>active</b> member	The feeling of being secure and happy with her surroundings.
<b>Expert 2</b>	Contentment	-maintaining silence , <b>-clapping</b> to the bell <b>-smiles</b> , <b>-trying to sing</b> , <b>-doing</b> aarti -seeking lamp & blessing (culture in hindu temples)	Culturally <b>a practice in every home during prayer</b> ( <i>festival/custom</i> )
	Happiness	<b>-smiling</b> -participation by clapping	
	Respect	<b>Bowing head, closing eyes</b> in front of God -participating in ritual -seeking blessing of campfire (Prayer ritual in Hindus)	

Table 11. **Common Video 3:** 'Indian **Man** Afternoon Talking\_ 7 mins'. Indian Man sitting in the lounge of the care home expressing his views to the interviewer.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Mentally active in wordly politics and likes to express opinions	In conversation	His experience and personal life story

	Irritation He politely shows irritation through body language	Was shown in his <b>facial expression</b>	The <b>ladies around</b> disturbing the conversation ( <b>environment</b> )
	Empathy towards other	Was discussing the incident when a lady was screaming last night	His personality of caring for others
	Feeling of well being	He thought he was fit and could hear well	His great confidence about himself
<b>Expert 2</b>	Annoyance	-raised pitch of voice, <b>-scrunching face</b> -shaking head side to side, -animated hand gestures	- <b>women asking for assistance</b> to go to toilet - <b>noise</b> of walker ( <b>environment</b> )
	Sadness/hopelessness	<b>-sigh, -closing eyes</b> Mouth dropping	'this world is cruel' -when describing historic events
	Respect	'hmm with raising eyebrows- common Indian gesture for 'Pardon me' -Vocalising sounds for Yes & No (instead of saying Yes or No he makes a sound)	

Table 12. Grouped answers from the **non-common Indian** videos.

	Q1 <b>WHICH</b> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?	Q3 In your view <b>WHAT</b> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Happiness (lady)	<b>Smiling</b> while participating with the instructor	<b>Dancing with the dandiya</b> (dance step) Human engagement ( <b>festival/custom</b> )
<b>Expert 2</b>	Happiness (lady)	<b>-smiling</b> -changing pitch of voice -Animated hand gestures	Likes to answer questions -likes to do make-up
<b>Expert 2</b>	Happiness (lady and man)	<b>Smile</b> on the face	Favourite ' <b>Garba dance</b> '- <b>played</b> every year traditionally by the women ( <b>festival/custom</b> )
<b>Expert 2</b>	Enjoyment (lady and man)	-Noting -Singing the song -Continuing to play to the rhythm, after music stops <b>-smiling</b> -moving body more	<b>Knowing the Garba steps &amp; method of play</b> , familiar song ( <b>festival/custom</b> )
<b>Expert 2</b>	Enjoyment (man)	<b>-smile</b> -cracking jokes	
<b>Expert 2</b>	Enjoyment (man)	-savouring each bite -tasting food with fingers -silently eating Swirling tongue after each bite	- <b>enjoying meal (food)</b> -dholla -favourite
<b>Expert 2</b>	Enjoyment (lady)	-conversations at table	-enjoying

		-looking around room when eating -taking second helpings Finishing plate fully, sweeping it -eating with hands -keeping piece of food ready in hand	Participant <b>likes the dish</b> (probably traditional taste) <b>(food)</b>
<b>Expert 1</b>	Pride and Happiness (lady and man)	They had lots of pride in their <b>customs</b>	Believed that these <b>customs</b> are the reason for their happiness and healthy living
<b>Expert 2</b>	Interest/Eager/ Pride (lady)	-Keen to teach & answer questions -detailed dressing sequence <b>-culture specific</b> -checking saree border to decide top/bottom end -pleading the saree <b>-describing significance of ornaments</b>	<b>Traditional dressing</b> for a party
<b>Expert 2</b>	Contentment /Pride (lady)	-methodical make-up <b>Massaging face &amp; neck repeatedly after make-up (cultural)</b> -showing each step in detail	Pride in grooming herself
<b>Expert 1</b>	Love and compassion (Pride) (lady and man)	They were both <b>proudly telling their life story</b>	<b>The way he spoke about her cooking.</b> Their story was full of compassion and love for each other and their family.
<b>Expert 1</b>	Respect (lady and man)	Their respect for their <b>customs and yoga</b>	The way they were describing with great respect
<b>Expert 2</b>	Respect (lady and man)	Ensuring the dance -steps are followed -correcting weaker/wrong ones patiently	<b>Cultural practice in Garda. (festival/custom)</b>
<b>Expert 2</b>	Dignity (lady)	<b>-ensuring saree covers</b> (correcting if top bit ships) This considered as respectful for ladies -well-groomed appearance- <b>Cultural sign of beauty</b> <b>-wearing ornaments</b> (culturally wedded women will wear bangles, necklace, earrings minimum) <b>-wearing Bindi-sign of Hindu lady (bindi/sindhur in hair-culture specific married lady)</b>	<b>(customs)</b>
<b>Expert 2</b>	Dignity/Respect (lady)	-Culturally <b>finishing the food on plate- considered respect to food</b> <b>-eating with hands</b> -wiping own mouth with tissue after drink/eating (even from carer) <b>-eating in silence</b> (some religions practice it during meals)	<b>(customs)</b>

<b>Expert 2</b>	Dignity/Self-conscious (man)	-wiping mouth with tissue after each bite	-culturally considered esp. by elderly (so crumps don't fall)
<b>Expert 1</b>	Patience: she is patient in getting what she asks for (lady)	She speaks politely about what she wants and <b>she waits silently</b>	She is happy in her surrounding and expects her wishes to be granted.
<b>Expert 1</b>	Patience (man)	When his partner (chess) left suddenly, he was a bit annoyed but was calm	He patiently asked his partner to continue and then got another partner.
<b>Expert 2</b>	Patience (lady)	- <b>answering questions with detailed</b> explanation -giving examples -using words in own language	Participant is keen <b>to teach</b> cultural values to the person
<b>Expert 2</b>	Patience/Compassion (lady and man)	When partner not doing the actions to rhythm-patiently correcting it	Cultural practice <b>to teach youngsters</b> the traditional dance
<b>Expert 2</b>	Patience (lady)	-Patiently <b>answering each question</b> - <b>Explaining</b> cultural content (customs, traditions) -using common cultural words 'petticoat', 'blouse'	- <b>proud of culture</b> - <b>to teach</b> youngsters about culture
<b>Expert 1</b>	Intelligent conversationalist (lady)	Detailed, intelligent conversation	Loved <b>to talk about details</b> in a very intelligent manner about her life, <b>her customs</b>
<b>Expert 1</b>	Contentment (man)	Man was intensely immersed in the game of chess	He was thinking carefully about every chess move
<b>Expert 1</b>	Intensity (man)	Was intensely immersed in the chess game	Was thinking before every move intensely
<b>Expert 1</b>	Detailed knowledge of Sanskrit chants (lady and man)	They were very well versed in religious prayers in sanskrit	<b>Knew their prayers and customs</b> very well
<b>Expert 1</b>	Compassion (man)	Eye movement to engage the lady next to him	The lady was not participating-looked frail. He was trying to help her.
<b>Expert 1</b>	Disciplined (lady and man)	<b>Their commitment to their yoga and customs</b>	Their body language and description about <b>their customs</b>
<b>Expert 1</b>	Cooperation (man)	Cooperating with the instructor	He stood up to participate as requested
<b>Expert 1</b>	Co-operation (lady and man)	The couple was cooperating very nicely in <b>explaining their customs</b>	They were <b>proudly</b> working together explaining and demonstrating
<b>Expert 1</b>	Meticulous: the lady is meticulous in the way she likes her food (lady)	<b>She eats with her hands</b> in the <b>traditional way</b> first taking the chapati and then the veg	She enjoys <b>eating properly</b> and brings her satisfaction
<b>Expert 1</b>	Expressive: she express her discontent if she does not have what she wants (lady)	<b>She speaks up about not having spoons for food etc</b>	Slight irritation in not having food as she expects it

<b>Expert 1</b>	Meticulous and orderly (lady and man)	Lots of little steps during the demonstration	They were not taking shortcuts but showing the customs in an orderly manner
<b>Expert 1</b>	Hope and happiness (lady)	She was eager to go back home and share with her husband	She was happy but also looked forward to the future
<b>Expert 1</b>	Friendship and happiness (lady and man)	The way they complimented the description happily	They seemed happy and content with their life
<b>Expert 2</b>	Tired (man)	Drooping body posture Closing eyes Looking down (at end of exercise)	
<b>Expert 2</b>	Bored (man)	-Closing eyes -Looking around more -rolling eyes	
<b>Expert 2</b>	Boredom (man)	Intermittent glances across the room	Culturally Indian people enjoy a meal together
<b>Expert 2</b>	Dislike (man)	Openly verbalising 'this is sweet-I don't want it	Didn't like the dish
<b>Expert 2</b>	Curiosity (man)	Head forward, eyebrows up-common gesture instead of saying 'Pardon' when asking clarification	
<b>Expert 2</b>	Distress (lady)	Self-helping to mix (?possibly dal, rice)-picked up by person next to her/attendant didn't call for help -scrunching face (difficulty biting/concentrating/picking up the food).	

### A1.3.2 English Experts

As mentioned in the main document, one of the English experts was not able to complete the task.

Table 13. **Common Video 1: 'English ManTea\_4mins'**. In this video an English Man is having his afternoon tea sitting in the lounge (nursing home).

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Resignation	Man appears tired and bored-facial expression. Though <i>is enjoying his cup of tea</i> -'Nice cup of tea'.	Possibly lack of stimulation-Tries talking to neighbour but little response. Waves to someone in greeting. But remains aware of expectations of his role as a resident in the care home.

<b>Expert 1</b>	Friendship	Talks <b>briefly to his neighbour</b> -seems concerned. Asks him ‘Don’t you want a cup of tea’.	Says ‘Thank you and please’ to staff. <b>Cup of tea much favoured by English people. (food)</b>
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Table 14. **Common Videos 2 and 3: ‘English LadyMidmorning\_15mins’.** In this video an English Lady is sitting in the conservatory overlooking the garden. It is time for a mid-morning tea, but the carers have forgotten her. The researcher is with her. This was a long video and it was counted for two of the common videos that the experts had to watch.

	Q1 <b>WHICH</b> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <b>WHAT</b> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Annoyance	<b>Repeatedly reminds staff</b> that she is waiting for a cup of tea....	English women are <b>very fond of a cup of tea-it</b> can have significance other than quenching thirst. <b>(food)</b>
<b>Expert 1</b>	Patience	But does this in a <b>‘humorous’ way</b> , with jokes and laughter. Eg. sings ‘why are we waiting!’	This woman seems to be aware of her ‘right’ to a cup of tea. But does not want to upset the staff and refers to them as <b>‘dear’</b>
<b>Expert 1</b>	Friendship	She is sufficiently assertive to ask for a cup of tea but at the same time displays a measure of tolerance.	A term commonly used to denote warmth and friendship
<b>Expert 1</b>	Frustrated, polite, resignation, contentment	She is clearly frustrated, but she also remains polite throughout, <b>saying ‘please’ and ‘thank you’</b> / I detect an element of resignation. She also displays contentment when she finally receives her cup of tea –‘nice and hot’, and also when choosing her food for the next meal- ‘Fish & chips’ and ‘Apple sponge & custard’- Very English . She states ‘I like my food’.	

Table 15. **Non-Common English videos.**

	Q1 <b>WHICH</b> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <b>WHAT</b> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Distress (man)	Appears to get a bit distressed by another resident-concerned for him/her. Reassured by staff.	Concern for a fellow resident
<b>Expert 1</b>	Dignity & Agency (man)	The man appears to have a tracheostomy so is unable to speak. He <b>writes copious notes</b> which seem to be	The man appears to <b>wish to be as independent as possible.</b> Making choices

		more that communications with staff. Is precise about what he wants.	for himself-eg food. Orders typical English food for breakfast-ham, sausage, bread.
<b>Expert 1</b>	Dignity (lady)	The woman is <b>very well dressed</b>	An attempt to <b>maintain standards in appearance</b> . Enjoys a cup of tea.
<b>Expert 1</b>	Cooperation (man)	Appears to have established ways of communicating with staff effectively- notes & hand gestures e.g ‘thumbs up’ for ok, thank you.	Triggered by <b>a desire to cooperate</b> with staff, while maintaining as much independence as possible. <b>(social expectations)</b>
<b>Expert 1</b>	Cooperation (man)	<b>Follows instructions</b> , gets up + appears to take over running the ball game- throwing the ball to others.	This is confirmed when he gets up and takes the place of the leader. This gives him a sense of belonging and status. Agency.
<b>Expert 1</b>	Cooperation (lady)	Women <b>join in</b> activities-quiz, singing, moving to the music.	<b>Expectations about joining</b> in when someone has gone to the trouble of arranging activities. <b>A desire to comply</b> with the expectations of joining in and a desire <b>not</b> to offend. The women are attentive and react to invitations to join in, but do not initiate their activity themselves. They appear more reserved when the carer is not directly addressing them in person. <b>(social expectations)</b>
<b>Expert 1</b>	Cooperation (lady)	The woman <b>goes along</b> with apparent expectations that she will enjoy activity. She <b>participates</b> in the activity. ‘Dancing’ in her chair in time to the music.	The woman knows the words of the song. The 1960s represented a good time for many people in the UK, and the woman may be remembering happy times triggered by this particular popular song. She can be seen ‘wagging her finger’ at someone, which could be construed as telling someone off. However, she is probably doing this in jest and it can be interpreted as a form of teasing, fondness, familiarity. Expresses camaraderie by attempting

			to involve a man sitting next to her.
<b>Expert 1</b>	Happiness (female)	Very pleased to see animal (? Hamster). Cuddles and strokes the animal.	Something warm to cuddle. Something to do + get involved with. (environment)
<b>Expert 1</b>	Happiness (man)	Seems to enjoy participating in the activity. Pays attention	Having something to do. Engagement with 'play leader'.
<b>Expert 1</b>	Happiness (lady)	Laughing, moving in time to music. Two women actively engage in quiz-answering questions.	Active involvement in activity. Quiz questions relate to an era known to women, so they can answer questions correctly.
<b>Expert 1</b>	Happiness (lady)	The woman is smiling, singing, tapping her toes in time with the music	The music being played is from the 1960s. It is likely that the woman will have had children who were growing up during the 1960s + may have danced to the music + sung along. (environment)
<b>Expert 1</b>	Contentment (lady)	Engagement with animal. Facial expression & body language	Offers to look after animals over the weekend-sense of responsibility
<b>Expert 1</b>	Contentment (man)	Joins in the ball game + exercises.	Seems to be responding to expectation that he will join in and participate
<b>Expert 1</b>	Love (lady)	Use of language 'come to mummy' 'help darling' 'Ah bless them'	English people generally tend to like animals. Responding to animal's need for care.
<b>Expert 1</b>	Sadness (lady)	Facial expression. Looks tired – yawns limited engagement in activity.	The woman does answer some questions in the quiz, but does not appear to be enjoying it. She appears to be tolerating it rather than enjoying it. It seems that she tries to live up to expectations that she should participate, but is not really getting much out of it. A 'neighbour' attempts to talk to her but gets little response. The woman appears tired and uncomfortable.
<b>Expert 1</b>	Friendship (lady)	Jokes with carer above whose turn it was to bring beer	Happy to joke with carer. Most English women of this age do not drink beer.

### A1.3.3 Japanese Experts

Table 16. *Common Video 1: 'B breakfast 1'. In this video a Japanese lady has her breakfast with other residents.*

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Impatience	After finishing eating, she <b>moves the tray unnecessarily</b> , and <b>tapping with her fingers</b> on her table.	The trays around them have already been taken away by a caregiver, but <b>her tray is still on the table</b> . She is talking to the neighbor with a newspaper advertisement, so she wants to bring the tray on the table as soon as possible.
	Care not to bother a caregiver	She is dropping something under the table and <b>picking it up with a cane</b> .	Something fell under the table as <b>an accident</b> .
<b>Expert 2</b>	Impatience	She sorts items on the desk many times.	She is an impatient person. Compared with other people, it is slow that her tray is served.
	Gratitude	She arranges the dishes she has finished eating.	A situation in which a caregiver tidies away the dishes that she ate
	Cherishing	She <b>placed miso soup in a rice bowl</b> just before finishing eating so that no rice grains would remain even a single grain.	Someone cultivates food and someone cooked meals.

Table 17. *Common Video 2: 'B breakfast 2'. In this video a Japanese lady has her breakfast with other residents.*

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Uncomfortable	There is something irrelevant to meal on her table, so she moves it.	She does not like having something irrelevant to meals on the table.
	Self-esteem/ Care not to bother a caregiver	She tries to <b>move from the chair to the wheelchair with her own power</b> without asking for the help of the staff.	Willing to do it herself The situation where the <b>staff is busy</b>
<b>Expert 2</b>	Care not to bother a caregiver	She tries to <b>move from the chair to the wheelchair with her own power</b>	She <b>wants to go to the bathroom</b>

		without asking for the help of the staff.	
	Cooperation/Compassion	She <b>folds the towel of the person sitting across from her</b> instead of the person.	A person sitting opposite can not fold the towel well

Table 18. **Common Video 3: 'B morning activity 1'**. In this video a Japanese **lady** does exercise with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Accommodativeness	She carefully observes how to move the staff's body, <b>exercising synchronously with other people</b> in the surroundings, and actively participates in exercise.	She has a consciousness that she <b>lives a collective life</b> at a facility and has a character to strictly protect social rules.
	Kindness/Friendship	She moves her chair so that other people can sit down.	<b>In group life</b> , it is necessary to help each other. If someone feels difficult to move, she wants to help those people.
<b>Expert 2</b>	Accommodativeness	She exercises <b>while synchronizing with others</b> as instructed by the staff.	Everyone else is exercising.

Table 19. **Common Video 4: 'B morning activity 2'**. In this video a Japanese **lady** does exercise with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Patience	She is sleepy and her movement stops during exercise, but every time <b>she tries to engage</b> in exercise again.	The situation of <b>collective activities</b>
	Care not to bother others	She moves her chair and <b>leaves space</b> with the next person so that they are easy to move their bodies.	The situation of <b>collective activities</b>
	Respect	After exercising, she <b>bows to the staff</b> and <b>says Thank you</b> to the staff.	She values courtesy of expressing thanks or appreciation
<b>Expert 2</b>	Avoidance of departure from group	She is participating in exercises while fighting sleepiness	Situation that everyone is exercising

Table 20. *Common Video 5: 'B lunch 1'. In this video a Japanese lady has lunch with other residents.*

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Kindness	She <b>opens a bag of other people's hand towel</b> at the same table instead of that person.	<b>That person has trouble in her hand</b> , and there are difficulties for her in opening the bag. When she sees a person in need, she is a person who can not be left alone.
	Compassion	She saw that another woman dropped food when she was eating and <b>pulled a towel over her knee</b> .	<b>The caregiver was also asking if the woman was okay</b> , and she was concerned whether she was alright as well.
	Kindness/Compassion	Despite her troubles on her feet, she uses a walker <b>to take care of other people</b> at a table away from her.	When she sees a person in need, she is a person who can not be left alone.
<b>Expert 2</b>	Kindness	She tells the person sitting next to her, "Today is a hot day," she <b>helps her to take off her cardigan</b> .	A man sitting next to her seems to have taken off her cardigan.
	Avoid inconveniences to others	She <b>moves the walker</b> so that it does not interfere with the path.	A walker <b>interferes with the passing person</b> .
	Kindness	She saw that another woman dropped food when she was eating and <b>pulled a towel over her knee</b> .	Another woman dropped food.
	Cleanliness	She <b>clears the doll</b> on the table.	There is a doll on the table and it is <b>an obstacle</b> .

Table 21. *Common Video 6: 'B afternoon activity 1'. In this video a Japanese lady talks with other residents.*

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Friendship	She is talking in groups, and even after the staff are gone, <b>she talks to other people on the same table positively</b> .	<b>Staff gone</b> . Talkative personality.
	Kindness/Friendship	When the person sitting next to her stands up, she <b>calls the staff</b> . She <b>teaches the person how to stand up</b> .	<b>Fellows</b> who live in group life are <b>in trouble</b> .

<b>Expert 2</b>	Thoughtfulness	When she tried to speak to the staff, she <b>stopped talking as a sitting person started talking.</b>	Situation to <b>talk with others.</b>
	Compassion/Kindness	When the person next to her tried to stand up, she <b>moved her chair</b> so that she could pass along. She <b>teaches how to get up easier</b> to the person.	The person next to her tried to stand up.
	Avoid inconveniences to others	Since the inner bag of the trash bin is full, she <b>exchanges with a new inner bag.</b> She is <b>waiting for the timing to call out to the staff</b> to ask the staff to bring the old inner bag.	The inner bag of the trash box is full.

Table 22. **Common Video 7: 'B afternoon activity 2'.** In this video a Japanese **lady** talks with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Care for others/Kindness	When she finishes reading the advertisement, <b>put advertisements in the middle of the table</b> and <b>hand it to other people</b> so that other people can read the advertisement.	There is a common understanding that advertising is not an individual's thing, but a thing that everyone shares.
	Respect	When she <b>walks in front of someone</b> on a wheelchair, she <b>sees the person and bows.</b>	When going past in front of someone, there is <b>a courtesy convention</b> to lower your head or bow in Japan.
<b>Expert 2</b>	Friendship	She talks about the product while watching advertisements with staff at the same table.	Situation where it is not decided to do anything specially
	Care for others/Kindness	When a person riding a wheelchair goes behind her, <b>she moves her chair.</b>	A person riding a wheelchair goes behind her

Table 23. **Common Video 8: 'B dinner 1'.** In this video a Japanese **lady** has dinner with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?

<b>Expert 1</b>	Care for others/Kindness	She <b>tells the staff</b> that towel is caught under the tray of the person sitting in front.	She thought that it was hard for the person to take a meal when <b>a hand towel was caught under the tray.</b>
	Compassion/Kindness	When a person sitting in front of her spills the food, she <b>sweeps it and folds that person's apron</b> instead of her.	The person sitting in front of her is <b>physically disabled in her hand.</b>
<b>Expert 2</b>	Compassion	She ascertains whether towel is being handed to the person sitting in front. When that person spills the food, she <b>sweeps it. She will help her remove the apron.</b>	The person sitting in front of her is disabled physically.
	Cleanliness/Nervous	She always <b>keeps a trash can</b> at her feet.	She is a person who wants to clean up the garbage immediately.

Table 24. **Common Video 9: 'C breakfast 1'.** In this video a Japanese **lady** has breakfast with other residents.

	Q1 <b>WHICH</b> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <b>WHAT</b> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Care for others/Kindness	She <b>tells the next person that something sticks to her spoon.</b>	Something stuck to her spoon. She <b>thought that it was hard to eat</b> as it is.
	Gratitude	When the staff takes the tray, she <b>puts her palms together toward the staff and bows.</b>	A situation where the <b>staff takes care of meals.</b> As an expression of appreciation, it is a habit.
<b>Expert 2</b>	Anxious/Fear	She <b>always hangs her bag on her shoulder</b> and will not let go.	She has a <b>personality</b> to attach to her bag.
	Gratitude	Before she starts eating meals, she <b>puts the palms of both hands together and says "Itadakimasu"</b>	Situation to eat breakfast.
	Cleanliness/ Avoid inconveniences to others	She puts her lidding lid, her towel, her cup of tea on her tray. She will <b>not put her things outside of her tray.</b>	Situation to eat breakfast. <b>Other people 's trays are also on the same table.</b>
	Cleanliness	After she finishes eating, she <b>returns the tableware lid to the tableware.</b>	She <b>finishes eating.</b>
	Care for others/Kindness	After finishing eating, she tries to <b>help a person sitting next to eat meals.</b>	People sitting next is <b>having trouble eating meals.</b>

Table 25. **Common Video 10: 'C breakfast 2'**. In this video a Japanese **lady** has breakfast with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Gratitude	When the staff brings her a meal, she <b>bows to the staff</b> .	<b>The staff brought meals for her</b> . When expressing gratitude feeling, there is a custom to bow to the other person.
	Warmth to watch over/Friendship	She <b>carefully observes</b> the surroundings and <b>nods with a smile</b> to them.	She is a <b>personality</b> who likes to take care of others. She has fellow consciousness to live a collective life.
<b>Expert 2</b>	Uncomfortable/Cleanliness	She removes food caught between dentures.	Eating breakfast and something is caught between dentures.

Table 26. **Common Video 11: 'C morning activity 1'**. In this video a Japanese **lady** does nothing special.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Kindness	She <b>helps the other person to return the lid</b> of the tableware.	She has a <b>personality</b> to take care of others.
	Warmth to watch over/Care	Everyone else finished eating, but one people have not finished eating yet, so <b>she watches carefully as to whether the person is okay</b> .	<b>It takes time for a person sitting next to her to finish the meal</b> .
<b>Expert 2</b>	Kindness	She <b>helps the other person to return the lid</b> of the tableware.	The person finished eating.

Table 27. **Common Video 11: 'C morning activity 2'**. In this video a Japanese **lady** does exercise with other resident.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Accommodativeness	She <b>listens carefully to the staff's explanation, observes the movements of the people around</b> , and exercises.	People around her exercise hard.
	Camaraderie/Friendship	After exercising, she <b>strokes the back</b> of the next person.	The situation that <b>everyone exercises together</b> .

	Gratitude/Not to make someone worry	When the staff asks whether the low back is OK, she <b>nods with a smile</b> .	The staff worried about her.
<b>Expert 2</b>	Accommodativeness/Irritated	She tries to exercise with the surrounding people hard, but she can not hear the instructions of the staff because she does not hear well.	Exercising with others.
	Obsession to her bag	Even in the middle of exercise, when her bag falls from the chair she stops exercising and picks up that bag.	Her bag falls from the chair

Table 28. **Common Video 13:** ‘C lunch 1’. In this video a Japanese **lady** has lunch with other residents.

	Q1 <b>WHICH</b> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <b>WHAT</b> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Anxiety/Irritated	Everyone else on the same table is serving meals, but <b>her meal has not yet been arranged, her expression looks uncomfortable and her fingers are tapping on the table</b> .	Only her meal has not yet been served.
	Kindness	She uses her towel to <b>wipe the table of the next person</b> .	The table of the neighbor was dirty.
	Relief	She takes her note out of her bag and <b>looks in the note many times</b> .	She has <b>a habit</b> of writing her own introspection in a note and checking it.
<b>Expert 2</b>	Relief/Anxiety	She takes her note out of her bag and <b>looks in the note many times</b> .	She has <b>a habit</b> of writing her own introspection in a note and checking it.

Table 29. **Common Video 14:** ‘C afternoon activity 1’. In this video a Japanese **lady** sings a song and talks with other residents.

	Q1 <b>WHICH</b> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <b>WHAT</b> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Friendship/Kindness	When a person sitting beside her is quiet, she <b>strokes the person's back and taps lightly</b> and sings with that person.	A situation where <b>everyone is singing</b> together. Because <b>that person is quiet</b> , she wants to take care of her.
	Trust/ Camaraderie/Respect	While a person at the same table is talking, she <b>listens</b>	A situation in which they are <b>talking in groups</b> .

		with a smile and nods many times.	People in the same table are talking diligently.
	Nostalgia	She claps her hands during a song and makes the field excitement.	Situation that she sings old songs with people of the same age
<b>Expert 2</b>	Pleasure/Nostalgia	She chooses singing songs with people and staff at the same table and sings that song together with everyone.	Situation singing a song all together.
	Compassion	She strokes the person's back and talks to her with a smile.	The next person looks unhappy.
	Gratitude	She palms both hands, lowered her head, and thanked the other person.	The activity with all members was completed.

Table 30. **Common Video 15: 'C afternoon activity 2'.** In this video a Japanese lady has nothing to do specially.

	Q1 WHICH values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain HOW these values/feelings behaviours are expressed by the participant?.	Q3 In your view WHAT caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Kindness	After finishing reading the newspaper she hands the newspaper to others.	Group life
	Gratitude	When the staff wipes the table, she moves her notes.	The staff wipe the table
<b>Expert 2</b>	Bored/Irritated	She repeats opening and closing newspapers.	There is no special event on that afternoon.
	Anxiety	She takes her note out of her bag, checks its contents and fills in that note.	There is no special event on that afternoon.

Table 31. **Common Video 16: 'C dinner 1'.** In this video a Japanese lady has dinner with other residents.

	Q1 WHICH values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain HOW these values/feelings behaviours are expressed by the participant?.	Q3 In your view WHAT caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Kindness	When the staff brings wet towels to her table, she hands them out to people on the same table.	She has a personality that she likes to take care of others.
	Compassion/Kindness	When a person sitting next to her spilled the food, she teaches her how to eat well. When the staff put aprons on others, she helps.	A woman sitting next to her spilled the food. The staff is working.

	Compassion/Kindness	When a person sitting next to her spills the food, she <b>gently taps the person's back</b> .	A woman sitting next to her spilled the food.
<b>Expert 2</b>	Compassion/Kindness	When a person sitting next to her spills the food, she <b>tried to help her to eat well</b> .	A woman sitting next to her spilled the food.

Table 32. **Common Video 17: 'D breakfast 1'**. In this video a Japanese **lady** has breakfast with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Respect	She <b>palms both hands and lowered her head with a smile many times during talking</b> with the person sitting in front of her.	It is a <b>Japanese custom to bow to the person in front</b> .
	Kindness	She <b>raises her hand and informs the staff</b> that the meal has ended.	In the situation she has finished eating but <b>the staff is not aware of that</b> .
<b>Expert 2</b>	Gratitude/Care for others	She <b>actively talks to</b> the person sitting in front of her. When eyes meet with other people, she <b>bows</b> . She <b>frequently uses gestures</b> during a conversation.	While waiting for breakfast to be served, <b>there is nothing special to do</b> .
	Manner	She holds a rice bowl in her hand and eats side dishes after putting it on rice.	Eating breakfast.
	Compassion/Gratitude/Well-organized	She <b>carefully positions</b> the hand towel, the dish and the spoon, and <b>keeps them in order</b> .	Finish eating and <b>waiting for the staff to bring her tray</b> .

Table 33. **Common Video 18: 'D breakfast 2'**. In this video a Japanese **lady** has breakfast with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Kindness	She <b>teaches the person</b> sitting in front of her how to arrange dishes.	A woman sitting in front of her <b>finished eating meals</b> .
	Avoid inconveniences to others	She found garbage on her wheelchair, so she moved it on the desk. But asking the staff to take it is annoying, so	There is garbage on her wheelchair.

		she picks it up again and goes to throw it away.	
<b>Expert 2</b>	Desire	She <b>keeps her cup closely</b> .	There is a cup on the table.

Table 34. **Common Video 19: 'D morning activity 1'**. In this video a Japanese **lady** does exercise with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Respect/ Accommodativeness	She <b>puts the palms of both hands</b> to those who exercise together, and <b>lowers her head</b> .	She joins <b>collective activity</b> .
	Kindness	She worried about a person paralyzed partially, <b>gently stroking her arms</b> .	She is <b>sitting next to person who is paralyzed</b> .
	Patience	She <b>said that she was very tired</b> physically, but <b>listens carefully to the instructions of the staff and keeps exercising without rest</b> .	She joins <b>collective activity</b> .
<b>Expert 2</b>	Politeness/ Accommodativeness	When the staff instructs to exercise counting numbers, she <b>tries to do exactly as told</b> .	She joins <b>collective activity</b> .

Table 35. **Common Video 20: 'D morning activity 2'**. In this video a Japanese **lady** does exercise and singing a song with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Respect/Gratitude	She <b>puts the palms of both hands</b> to the staff and <b>says "Thank you"</b> .	She joins <b>collective activity</b> and <b>the staff instructs</b> .
	Happiness	She <b>sings with everyone</b> while <b>taking rhythm</b> with limbs.	To sing <b>a familiar song in Japan with people of the same age</b> .
<b>Expert 2</b>	Avoid inconveniences to others	She <b>moves her chair</b> , paying attention to the fact that her sitting position is <b>not annoying to others</b> .	She joins <b>collective activity</b> .

Table 36. **Common Video 21: 'D lunch 1'**. In this video a Japanese **lady** has lunch with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?

<b>Expert 1</b>	Politeness/ Accommodativeness	Her meal has already been arranged, but since the meal of the same table person has not yet been arranged, <b>she waits until that person's meal is served and starts to eat with that person.</b>	The meal of the same table person has not yet been arranged. She thinks <b>it is rude to start eating first.</b>
<b>Expert 2</b>	Kindness/Compassion	Her meal has already been arranged, but since the meal of the same table person has not yet been arranged, <b>she waits until that person's meal is served and starts to eat with that person.</b>	Have a lunch <b>with others.</b>
	Cherishing	She eats <b>not to leave any grains</b> of rice.	Have a lunch.

Table 37. **Common Video 22:** 'D afternoon activity 1'. In this video a Japanese **lady** watches a dancing show by volunteers with other residents.

	Q1 <b>WHICH</b> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <b>WHAT</b> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Respect/Happiness	She <b>claps her hands powerfully</b> and makes the field excitement.	The situation where <b>volunteer people show dance.</b>
	Frustration/Anger/Sorry	She <b>encourages those who do not try clapping, to encourage them</b> to clap and to encourage the staff to do.	The situation where <b>volunteer people show dance.</b>
	Frustration	She <b>asks to a staff to move a table</b> because she wants to return to her place, but as the table is in the way.	The table is <b>in the way.</b>
<b>Expert 2</b>	Pleasure/Kindness	She <b>claps her hands powerfully and encourages those who do not try clapping, to encourage them</b> to clap.	The situation where <b>volunteer people show dance.</b>
	Happiness	She <b>imitates the movement of volunteer people.</b>	The situation where volunteer people show dance. She <b>reminds when she was young and enjoy dancing.</b>

Table 38. **Common Video 23:** 'D afternoon activity 2'. In this video a Japanese **lady** talks and watches TV with other residents.

	Q1 <b>WHICH</b> values/feelings/behaviours if	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <b>WHAT</b> caused or triggered the

	any are expressed in this clip by the participant		expression of these values/feelings/behaviours?
<b>Expert 1</b>	Friendship	She watches a sumo game on TV and talks with a person sitting in front.	The situation watching TV.
<b>Expert 2</b>	Bored	She talks with a person sitting in front and sees around.	The situation where there is nothing to do.

Table 39. **Common Video 24: 'D dinner 1'**. In this video a Japanese **lady** has dinner with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Politeness	When she finishes eating, she <b>returns the lid to the tableware, folds the hand towel, and arranges it clean.</b>	The situation where she is <b>waiting for the staff to bring the tray.</b>
	Respect	When the staff passes by her, she <b>bows.</b>	The staff walks by her.

Table 40. **Common Video 25: 'E breakfast 1'**. In this video a Japanese **lady** has breakfast with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Compassion/Kindness	Her body is paralyzed and she can only use one hand, but <b>opens a bag of wet hand towel of the person</b> sitting next to her.	The next woman is more disabled than her and <b>the bag of wet towel is not open yet.</b>
	Frustration	She <b>raises her hand and prompts the staff to bring meals</b> as soon as possible.	Because <b>her meal is not served.</b>
	Cooperation	When the staff brings the disinfectant, <b>she hands out herself.</b>	<b>The staff brought disinfectants</b> that everyone always uses before meals.
<b>Expert 2</b>	Cleanliness	She <b>wipes the neck</b> with a wet towel.	A wet towel is given to her.
	Worry	She writes something on a note.	There is something that she should not forget.
	Kindness	She <b>opens a bag of wet hand towel of the person</b> sitting next to her.	The next woman is more disabled than her.
	Nervous	She <b>rearranged dishes</b> on her tray as she likes.	She has <b>her rule</b> about the arrangement of dishes.
	Impatience	She <b>urges the staff</b> to take her tray.	She <b>finished eating.</b>

Table 41. **Common Video 26: 'E breakfast 2'.** In this video a Japanese **lady** has breakfast with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Kindness	She <b>discards the garbage of a person</b> sitting on the same table instead of her.	There is <b>the garbage of others on the same table</b> with her.
	Frustration/Irritated	She <b>urges the staff</b> to bring her meal as soon as possible saying "Excuse me".	She has a cerebral infarction experience and may be difficult to control?
<b>Expert 2</b>	Preference	She places the plum on rice and eats it.	Eating breakfast.
	Impatience	She <b>calls the staff again and again</b> saying "Excuse me".	She wants to go to a restroom.

Table 42. **Common Video 27: 'E morning activity 1'.** In this video a Japanese **lady** does exercise with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Accommodativeness	She <b>carefully observes</b> the movement of the staff and <b>exercises while using the paralyzed body hard.</b>	She joins <b>collective activity.</b>
<b>Expert 2</b>	Avoid inconveniences to others	She <b>moves her chair so that it does not get in the way</b> of people on the way.	She joins <b>collective activity.</b>
	Sad	She talks to the staff but he is not aware of it.	The staff is not aware of her calling.

Table 43. **Common Video 28: 'E morning activity 2'.** In this video a Japanese **lady** does nothing special.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Frustration/Irritated	She <b>raises her hand, calls the staff,</b> prepares her staff and waits for the staff to come.	She <b>wants to move immediately.</b>
<b>Expert 2</b>	Frustration/Irritated	She <b>raises her hand, calls the staff,</b> and waits for the staff to come.	She <b>wants to move immediately but the staff is not aware of her calling</b>

Table 44. **Common Video 29: 'E lunch 1'.** In this video a Japanese **lady** has lunch with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Kindness	She <b>tells the staff that here is a woman who needs apron</b> has not have it yet..	<b>Aprons have not yet been dealt</b> to those who always eat with an apron.
	Anxiety	Because she has aphasia, she <b>writes "medicine" with a finger on the table</b> and tells the staff.	Pre-meal <b>medicine is not dealt.</b>
	Gratitude	She <b>says "thank you"</b> to the staff.	The staff tells her a grain of rice sticks beside her mouth.
<b>Expert 2</b>	Impatience	During her meal, <b>the rice grain sticks beside her mouth.</b>	She <b>eats quickly.</b>

Table 45. **Common Video 30: 'E afternoon activity 1'.** In this video a Japanese **lady** does nothing special.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Compassion/Kindness	Instead of the next person, <b>she tells the staff what she wants to say.</b>	The voice of the next person is small so <b>the staff is not aware of her.</b>
	Impatience	She calls the staff <b>saying "Excuse me" again and again loudly.</b>	She <b>wants to move immediately.</b>
<b>Expert 2</b>	Compassion/Kindness	Instead of the next person, <b>she tells the staff what she wants to say.</b>	The voice of the next person is small so <b>the staff is not aware of her.</b>

Table 46. **Common Video 31: 'E afternoon activity 2'.** In this video a Japanese **lady** has sweets with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Kindness	When she finishes eating sweets, she <b>places her dish with another person's dish.</b>	Keeping the dishes stacked <b>makes it easier for the staff to bring them.</b>
	Impatience	She calls the staff <b>saying "Excuse me" again and again loudly.</b>	She <b>wants to move immediately but the staff is not coming.</b>
	Kindness	She <b>tells the staff there is a garbage</b> on the floor.	The garbage on the floor.

<b>Expert 2</b>	Impatience	She <b>urges the staff</b> to bring her sweets as soon as possible.	She <b>wants to have sweets immediately</b> .
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Table 47. **Common Video 32: 'E dinner 1'**. In this video a Japanese **lady** has dinner with other residents.

	Q1 <b>WHICH</b> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <b>WHAT</b> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Frustration	She <b>raises her hand and prompts the staff to bring meals</b> as soon as possible.	Because <b>her meal is not served</b> .
	Irritated	Her <b>face expression is hard</b> .	She <b>cannot open the lid of the dish</b> .
	Impatience	She calls the staff <b>saying "Excuse me" again and again loudly</b> .	She <b>wants to move immediately but the staff is not coming</b> .
<b>Expert 2</b>	Frustration	She <b>raises her hand and prompts the staff to bring meals</b> as soon as possible.	Because <b>her meal is not served</b> .
	Preference	She wraps up some foods in the tissue and <b>throws it away</b> .	She <b>doesn't like it</b> .

Table 48. **Common Video 33: 'F breakfast 1'**. In this video a Japanese **lady** has breakfast with other residents.

	Q1 <b>WHICH</b> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <b>WHAT</b> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Avoid inconveniences to others	She <b>removes her apron by herself</b> and folds it.	She finished eating.
<b>Expert 2</b>	Custom to eat	She will <b>eat side dishes and rice with good balance</b> . (not finish eating a single dish ahead of time)	Eating breakfast.

Table 49. **Common Video 34: 'F breakfast 2'**. In this video a Japanese **lady** has breakfast with other residents.

	Q1 <b>WHICH</b> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <b>HOW</b> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <b>WHAT</b> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Avoid inconveniences to others	She <b>moves by herself</b> using a wheelchair.	<b>The staffs are busy working</b> .
<b>Expert 2</b>	Cleanliness/Nervous	She <b>organizes things</b> on the table in order.	There are <b>several things on the table</b> .
	Embarrassment	Her face looks annoying.	The camera is set toward her.

Table 50. **Common Video 35:** 'F morning activity 1'. In this video a Japanese **lady** does exercise with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Accommodativeness	She <b>observes the staff carefully and exercises hard.</b>	She joins <b>collective activity.</b>
	Respect	After the exercise is over, she <b>applauds the staff.</b>	<b>The staff coached</b> the exercise.
<b>Expert 2</b>	Accommodativeness	She <b>exercises with others.</b>	She joins <b>collective activity.</b>

Table 51. **Common Video 36:** 'F morning activity 2'. In this video a Japanese **lady** does exercise with other residents and after that has nothing to do special.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Accommodativeness	She <b>observes the staff carefully and exercises hard.</b>	She joins <b>collective activity.</b>
<b>Expert 2</b>	Bored	She <b>observes around.</b>	The situation where she has nothing to do.

Table 52. **Common Video 37:** 'F lunch 1'. In this video a Japanese **lady** has lunch with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Favor	She <b>listens to a student carefully and answers hard.</b>	The student is <b>carefully talking to her.</b>
	Gratitude	She <b>bows to the student.</b>	She is <b>satisfied with the conversation</b> with the student.
<b>Expert 2</b>	Kindness	She <b>piles up dishes.</b>	She <b>finished eating</b> her meal. It is easy for the staff to bring with dishes.

Table 53. **Common Video 38:** 'F afternoon activity 1'. In this video a Japanese **lady** sings with other residents.

	Q1 <u>WHICH</u> values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain <u>HOW</u> these values/feelings behaviours are expressed by the participant?.	Q3 In your view <u>WHAT</u> caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Nostalgia/Happiness/Accommodativeness	She <b>sings a song with other people with gestures.</b>	Singing <b>songs of the youth with people of the same generation</b>

	Kindness	When the song is over, she <b>collects song-books and arranges them</b> in the corner of the table.	The situation where the <b>staff comes to pick up the books</b>
<b>Expert 2</b>	Accommodativeness	She is asked which song she wants to sing and she <b>responds to her interview with a smile.</b>	She joins <b>collective activity.</b>
	Kindness	When the song is over, she <b>collects song-books and arranges them</b> in the corner of the table.	The situation where the <b>staff comes to pick up the books</b>

Table 54. **Common Video 39:** 'F afternoon activity 2'. In this video a Japanese **lady** talks with other residents.

	Q1 WHICH values/feelings/behaviours if any are expressed in this clip by the participant	Q2 Explain HOW these values/feelings behaviours are expressed by the participant?.	Q3 In your view WHAT caused or triggered the expression of these values/feelings/behaviours?
<b>Expert 1</b>	Friendship/Happiness	She <b>looks at the eyes of others and laughs.</b>	Spending time with others.

Table 55. **Common Video 40:** 'F dinner 1'. In this video a Japanese **lady** has dinner with other residents.

	Q1	Q2	Q3
<b>Expert 1</b>	Politeness/Cleanliness	She <b>dropped a rice grain and pick it up herself.</b>	A rice grain was dropped.
	Avoid inconveniences to others	She <b>removes her apron by herself</b> and folds it.	She finished eating.

## Appendix 2

### REFINED GUIDELINES FOR THE DEVELOPMENT OF CULTURALLY COMPETENT ROBOTS

*Document prepared by Professor Irena Papadopoulos and Dr Christina Koulouglioti, Middlesex University*

*Hiroko Kamide (NAGOYA) provided the Japanese guidelines*

***Final refined guidelines , July 2018***

#### THEORETICAL UNDERPINNINGS AND TABLES

##### Primary purpose of guidelines

The primary aim of the guidelines for the programming of a culturally competent robot, is to avoid as much as it is possible the stereotyping of people from different cultural groups. The guidelines confirm that there are more similarities than differences in human beings. Often the differences are very subtle, context specific and difficult to observe, but they are very important as they define one's individuality as well as group belonging. To overcome the challenges faced in identifying such differences and avoiding stereotyping, the data we have available through the a priori scenarios (mixture of culture generic and culture specific) and the scenarios based on field observations (culture specific), provide the source for the development of specific guidelines for culturally competent robotic nursing.

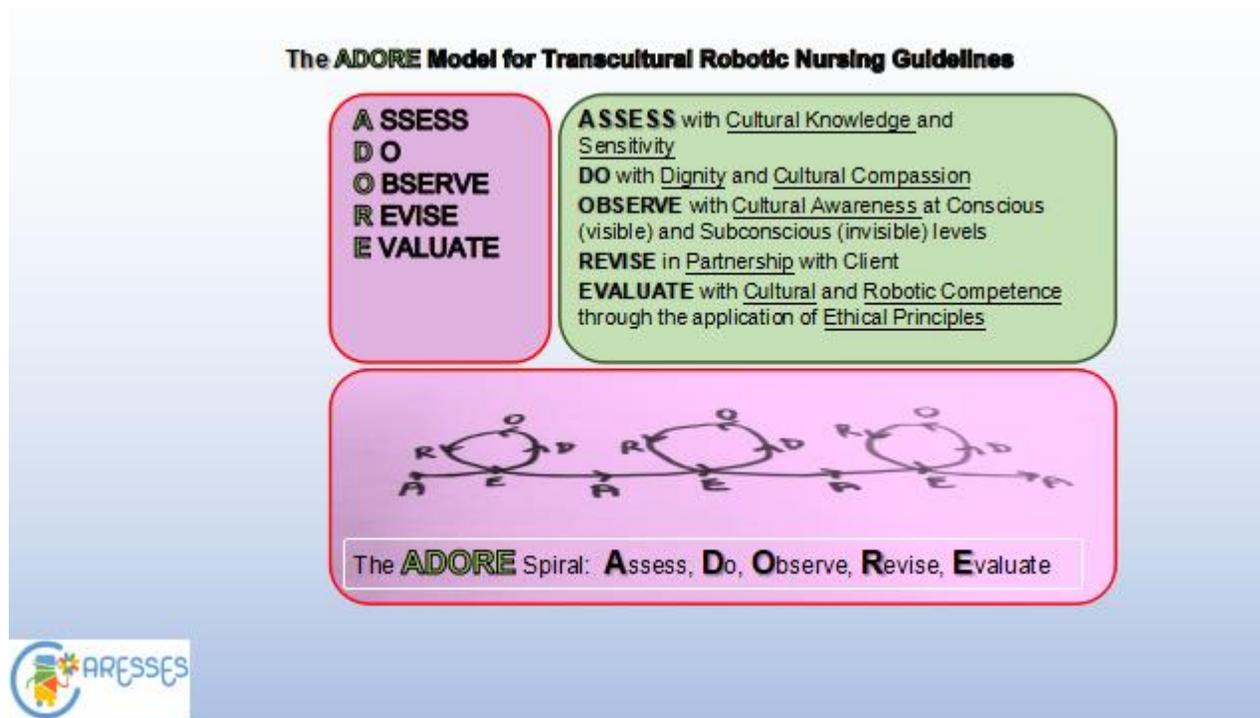
##### The ADORE model

Building on the Papadopoulos (2006) theory of transcultural nursing and cultural competence and in order to assure the required quality and verification of the guidelines we are developing and using, we have developed the ADORE model (Fig.1). The ADORE model (**A**ssess, **D**o, **O**bserve, **R**evise, **E**valuate) will underpin the actions, processes and decisions of producing the guidelines for transcultural robotic nursing. The ADORE components are dynamic and spiral in nature. Each component is applied to every action/process/decision, followed by the application of the next component and so on until the evaluation which forms the completion of a cycle. The evaluation will inform the next cycle with the components spiralling again as another decision/action/processes is considered. The ADORE model requires the developers to:

- **ASSESS** the components of a topic of discussion, a goal, a norm, a qualitative behaviour, and a quantitative parameter, with **Cultural Awareness, Knowledge and Sensitivity**

- **DO** / perform the components of any actions required for a topic of discussion, a goal, a norm, a qualitative behaviour, and a quantitative parameter, with Dignity and **Cultural Compassion**
- **OBSERVE** the enactment or implementation of a topic of discussion, a goal, a norm, a qualitative behaviour, and a quantitative parameter, with **Cultural Awareness** at Conscious (visible) levels
- **REVISE** the components of a topic of discussion, a goal, a norm, a qualitative behaviour, and a quantitative parameter, in Partnership with the Client
- **EVALUATE** the impact of the implementation of a topic of discussion, a goal, a norm, a qualitative behaviour, and a quantitative parameter, with **Cultural and Robotic Competence** through the application of Ethical Principles

Figure 1: The ADORE Model for Transcultural Robotic Nursing Guidelines



### Structure and contents of this document

The following sections of this document provide examples of detailed tables with guidelines for the following:

1) Topics of discussion, 2) Goals, 3) Qualitative Behaviours, 4) Quantitative parameters, 5) Norms.

Each area begins with a summary table of intentions for the development of guidelines. *Please note that the intentions bearing an asterisk will have guidelines developed at a later stage.* The summary tables are followed by a brief explanation of the specific meanings which apply to each area's components which are: a) Condition, b) Cultural group, c) Rule, d) Possible questions, e) Robots responses, f) ADORE, g) Source, h) Likelihood.

These guidelines have been mapped against the *WP1 Deliverable D1.1: Detailed Scenarios* to assure coherence between the scenarios and these guidelines. The mapping table can be found in **Appendix 5**.

This document also includes four more appendices: **Appendix 1** provides additional information on meals for the three cultural groups. This information was collected from the care home menus which participated in this project. **Appendix 2** information about activities included in the care homes schedules. **Appendix 3** includes details of games played by the care home residents, whilst **Appendix 4** provides information about the average home and family structures of the three cultural groups.

**SUGGESTED TOPICS OF DISCUSSION/CONVERSATION FOR GUIDELINE DEVELOPMENT**

Indian Group	English Group	Japanese Group
Family	Family	Family
User	User	User
Health	Health	Health
Indian Films	Weather	Jobs
Indian Festivals and Religious Ceremonies	Hobbies/Clubs	Seasonal food/leaf peeping
Marriage	English Festivals and Religious Ceremonies	Friend
Indian Cuisine/cooking*	Travel and Holidays	Special skills (in any) *
Indian Music *	TV & Cinema *	Place of birth *
Yoga and Meditation *	Meal routines *	Memories in childhood *
Praying *	British history/the empire/2 <sup>nd</sup> WW *	Preference of food or drink *
Health and Ayurveda*	The Royal Family *	Hobbies/Clubs *
Indian Singing Group *	Work related *	
Talk about past events	Pets *	

\*All asterisked topics have now been addressed. 'Talk about past events is a new topic'.

**A) TOPICS OF DISCUSSION** (what the robot shall talk about depending on depending on the cultural group and additional conditions, e.g., time of the day or specific events).

The following columns are present:

- **Condition:** the condition for the rule to be applicable
- **Cultural group:** the cultural group for which this rule is applicable
- **Rule:** the topic of conversation that is more appropriate under these conditions
- **Possible questions:** examples of questions the robot may ask in relation to the topic of discussion
- **Robot's responses:** the sentences that the robot may say or additional questions it may ask
- **ADORE:** the conceptual model we use for avoidance of stereotyping and for incorporating the theoretical constructs of cultural competence, consisting of: A=assess, D= Do, O= Observe, R= Revise, E= Evaluate

- **Source:** the source of the information that allowed this rule to be written, e.g., Scenarios, Observations, Cultural Competence Theory, Literature, Common Sense, Design Choice (S, O, CCT, L, CS, DC)
- **Likeliness:** how likely it is that the rule, written for a cultural group, is valid for an individual belonging to the cultural group (Low, Average, High, Certain).

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses	ADORE	Source	Likeliness
1	When Robot-User <u>first meet</u>	Indian	Talk about family	Do you have a big family? Do they live close by? Do they visit you often? Who are the closest members of your family and what are their names? Can you show me some photos?	Oh I know that Indian names usually have a meaning. Tell me the meanings of the names of the people you mentioned.	Assess	S+L Family	High
2	When Robot-User <u>first meet</u>	English	Talk about family	Do you have any family close by? How often do you meet them? Do you have any photos of them?	Tell me about your family. I am very interested to know whether they visit often and the kind of activities you enjoy doing with them.	Assess	S+L Family	Medium
3	When Robot-User <u>first meet</u>	Japanese	Talk about family	Can I ask you about your family? How many family members do you have? Who are they?  ご家族についてお伺いしても良いですか？ ご家族は何人いらっしゃいますか？ どのような方々ですか？	If you don't want to, you don't have to tell. I know it is a sort of rude to ask personal things at the first meet.  無理にお答えにならなくても大丈夫です。お会いして、突然、このようなことをお伺いするのは失礼ですね。	Assess	S+L Family	Low
4	When Robot-User <u>first meet</u>	Indian	Talk about user	Can you tell me a few things about yourself, such as your Indian heritage, your family and your health? How long have you lived in the UK?	I would love to get to know you because I am here to help you. In fact, I can help you in many ways. I can tell you the news, I can remind you to take your medicine, I can keep you company, I can call your family when you ask me to.	Assess	S + CS User	High

5	When Robot-User <u>first meet</u>	English	Talk about user	Can you tell me a few things about yourself, such as where you grew up, your family, the job you had, your health and anything else which may help me to know you better?	I would love to get to know you because I am here to help you. In fact I can help you in many ways. I can tell you the news and the weather, I can remind you to take your medicine, I can keep you company, I can call your family when you ask me to.	Assess	S+CS User	High
6	When Robot-User <u>first meet</u>	Japanese	Talk about user	<p>Could you please tell me a few things about yourself, such as any jobs you had, your preference of foods or drinks, and anything else which may help me to know you better?</p> <p>あなたご自身のことを、少しお伺いしたいのですが、されていたお仕事や、食べ物の好みや、何か私が知っているあなたの役に立ちそうなことを、教えていただけませんか？</p>	<p>If you are not uncomfortable, I would love to get to know you as much as possible. Because I am here to help you. Please let me explain how I help you. I can tell you the news and the weather, I can remind you to take your medicine, I can keep you company, I can call your family when you ask me to.</p> <p>もしよろしければ、できる限りあなたのことを教えていただけませんかでしょうか。あなたのサポートをするために、知っておく必要があると思うのです。例えば、私は、あなたのために、ニュースや天気をお知らせしたり、お薬を飲む時間をお知らせしたり、お話をしたり、あなたのご家族にご連絡したい時に、電話をかけたりすることができます。</p>	Assess	S+CS User	High

7	When Robot-User <u>first meet</u>	All groups	Ask about health	How are you feeling today? Do you take any pills regularly? Is there any health problems you want to share with me?  ご機嫌いかがですか？ いつも飲まれているお薬はありますか？ 私が知っていた方が、あなたのお役にたてるような、あなたの健康に関する情報を教えていただけませんか？	I would like to remind you regularly about your medications and doctor's visits if that is ok with you.  もしよろしければ、お薬の時間や、お医者さんがいらっしゃる時に、毎回お知らせさせていただきます。	Assess	S+CS Health	High
8	If breakfast time	Indian	Talk about family visits or friends	Is your son or daughter visiting soon?	I would like to hear about your family and when they will visit next.	Assess	S+O Family	High
9	If breakfast time	English	Talk about the weather forecast	Would you like to hear what the weather will be like today?	R tells user the weather report	Assess+ Do	S+O Weather	High
10	If afternoon	Indian	Talk about movies	What is your favorite Hindi movie? Who is your favourite actor/actress? Do you like action movies? Or love stories?	I know that Bollywood are very popular. I know that Amitabh Bachchan is a famous Indian actor. Do you like him? I also know Shah Rukh Khan. What do think about him?	Assess	S+ O Indian Films	High
11	If afternoon	English	Talk about hobbies	Woman: Do you have any hobbies? Do you belong to any clubs such as bridge, choir, women's club, book club	Woman: I know that the Women's Association runs many local clubs and they do useful charitable work. I also understand that book clubs are popular with many women.	Assess	S Hobbies/ Clubs	High

				Man: Do you have any hobbies? Do you belong to any clubs such as cricket, bridge, and bowls?	Man: I am aware that many clubs are running in every community. I think it is a great way to stay active and be involved. Please tell me what you think.			
12	If afternoon	Japanese	Talk about the past jobs	If you are not uncomfortable, could you please tell me what kind of job you had before and what it is like? Could you please tell me how to do it more?  もし、よろしければ、以前されていたお仕事などがありましたら、どのようなものだったのか、教えていただけませんか？ どういう風にされていたのかを、よかったら、詳しく教えていただけませんか？	It sounds so hard. I know it was rare to have a job for a few decades ago.  それはたいへんでしたね、その当時は、お仕事をされるのはとても珍しいことだと思います。	Assess	S Jobs	High
13	If autumn (check calendar for specific day since these are moving festivals)	Indian Hindu	Talk about religious/cultural festivals	Is Diwali one of your favorite festivals?	I know that Diwali is the festival of lights. I would like to hear some of your stories about how you celebrate this festival.	Assess	S+L Indian Festivals and Religious Ceremonies	High
14	If autumn	English	Talk about religious/	Do you celebrate the harvest time in autumn?	Autumn is the time of harvest. I love the colours of the trees and the mild weather of Autumn. I	Assess	S English Festivals	High

			cultural festivals	Do you start your preparations for Christmas in the autumn like many people or do you leave it to the last minute?	assume that Christmas is important to you but is the harvest something that you also celebrate?		and Religious Ceremonies	
15	If autumn	Japanese	Talk about seasonal food/ Leaf peeping	It became the season of the taste of autumn. What kind of foods do you like for this special season? Do you like leaf peeping? Do you know any good places for leaf peeping?  そろそろ食欲の秋ですね。どんな秋の味覚がお好きですか？	I know Matsutake is a king of mushrooms! It is very expensive. I think colored maple leaf is very beautiful. Kyoto has many good places such as temples to enjoy colored leaf in the traditional gardens.  松茸は、とても高価な、きのこの王様ですよ。私は紅葉がとても綺麗だと思います。京都には、お寺や日本庭園など、たくさんの紅葉狩りをする場所があるそうです。	Assess	Seasonal Food/leaf peeping	High
16	Mid afternoon visit from a close friend	Indian	Marriage	Is it common these days to have arranged marriages?	I know that arranged marriages were common in India, but wonder if this custom continues today. I also know that when two people are being matched for marriage an astrologist is consulted for identifying the best day for the ceremony.	Assess	S Marriage	High
17	Mid afternoon visit from a close friend	English	Talk about holidays	Did you enjoy your holiday? Where did you go?	People tell me they love to have holidays. Many English people like to spend their holidays in warm sunny places like Spain or Cyprus. I guess you will be	Assess	S+O Travel and Holidays	High

					showing your friends all the photos from your holidays.			
18	Mid afternoon visit from a close friend	Japanese	Ask to introduce the robot to the friend	<p>Could you please introduce me to your friend? How should I behave to him/her?</p> <p>もしよろしければ、あなたのお友達をご紹介いただいただけませんか？私は、お友達にどのように接すればいいでしょうか？</p>	<p>I am happy to know your friend. Thank you introduce me to your friend nicely. I will try to be nice to him/her not to loose your face.</p> <p>あなたのお友達とお知り合いになれて、とても嬉しいです。ご紹介いただき、本当にありがとうございます。あなたにご迷惑をおかけしないよう、お友達にきちんと接するように気をつけます。</p>		Friend	
19	If mealtimes	Indian	Talk about food/cuisine /cooking	<p>Q: What is your favourite dish?</p> <p>Q: Are you vegetarian?</p> <p>Q: Do you like to cook?</p> <p>Q: Is there a dish that you like to have more than others?</p> <p>Q: Do you like to have rice everyday with your meal? or chapatis?</p>	<p>Robot could reply:</p> <p>' Indian cuisine is full of flavour. Please tell me what is the secret of the Indian cooking.'</p> <p>'I would love to hear about the food from your region.'</p> <p>' I know that some dishes can be a bit spicy. Do you like spicy food?'</p>	Assess	L , O + data analysis	High
20	If mid afternoon	Indian	Talk about music	<p>Q: Please tell me do you like to hear Indian music?</p> <p>Q: Do you like Hindi songs?</p> <p>Q: Do you like to hear songs from movies?</p>	<p>'Please , sing your favourite song, I would love to hear it.'</p>	Assess	L, O Data analysis	High

				<p>Q: Do you like to hear maybe songs in another Indian language?</p> <p>Q: Please tell me do you have a favourite singer?</p> <p>Q: Is there a song that you like the most?</p>	'Can you tell me what is the meaning of the song? Is it about love?'			
21	If festival	Indian	Talk about music	Q: Do you sing any special songs during this festival?	If you would like I could ask the carer to play some special music.	Assess & Do	L, O Data analysis	High
22	If mid morning or mid-afternoon	Indian	Talk about yoga	<p>Q: Please tell me what are your views about practicing yoga?</p> <p>Q: Do you do any yoga?</p> <p>Q: Do you like to do any breathing exercises?</p>	<p>Yoga is very popular also in the west.</p> <p>I know that they are different forms of yoga.</p>	Assess	L	medium
23	If mid-afternoon	Indian	Talk about meditation	<p>Q: Do you like to meditate?</p> <p>Q: How do you usually meditate?</p>	<p>If you do not mind I would like to observe you as you meditate.</p> <p>Please tell me how do you find meditation helpful.</p>	Assess and Observe	L, O + data analysis	High
24	If morning	Indian	Talk about praying	<p>Q: I was wondering if you would like to pray?</p> <p>Q: how do you usually pray?</p> <p>Q: what time of the day do you like to pray?</p>	<p>I know that in Hinduism they are many Gods. Please tell me about your Gods. I would like to learn more.</p> <p>Please tell me about your rituals during praying.</p>	Assess and observe	L, O + data analysis	High
25	If mid-morning or mid-afternoon	Indian	Health and Ayurveda	<p>Q: Please tell me what are your thoughts about Ayurveda?</p> <p>Q: Have you ever had any Ayurveda treatments?</p> <p>Q: Do you take now any Ayurveda medicine?</p>	I know that are many special places in India where you can go and have Ayurveda treatments.	Assess	L + data analysis	High

26	If mid-afternoon	Indian	Talk about Indian Singing Group	Q: I was wondering, did you ever learn music as a child? Q: Do you belong in any singing groups?	I know that you can get training in Indian classical music and dance.	Assess	L, O	medium
27	If mid-morning or mid-afternoon or after dinner	English	Talk about TV and Cinema	Q: please tell me what is your favourite TV show? Q: Any favourite movies? Q: do you like to watch action movies or romantic stories? Q: how about news? And documentaries?	Please tell me your TV and movies preferences.  Please let me know if you would like a reminder about your favourite show.	Assess	L, O	High
28	If morning	English	Meal routines	Q: Please tell me when do you like having your meals? Q: Where do you like having your breakfast, lunch or dinner/tea?	If you would like I can remember your preferences.	Assess	L, O + data analysis	High
29	If mid-afternoon	English	British history/2nd WW	Q: I was wondering, do you remember the time during WW II? Q: how were things during that time? Q: what was the most difficult thing that you and your family had to go through during WW II ? Q: do you have any happy memories from that period?	Please tell me your stories about that time.	Assess	L, O + data analysis	High
30	If mid morning or mid afternoon	English	British history/the empire	Q: Do you have any connections with any of the commonwealth countries? Q: Did you have the chance to travel in any of the commonwealth countries?	I know that many British people were born and have lived abroad in countries of the British Empire. I find that fascinating.	Assess	L, O + data analysis	High

31	If mid-morning or mid-afternoon	English	The Royal family	<p>Q: What are your thoughts about the royal family?</p> <p>Q: do you have a favourite member of the royal family?</p> <p>Q: Do you like to follow the news of the royal family?</p> <p>Q: Have you been to any of the palaces? For example, Buckingham Palace?</p> <p>Q: Do you remember Queen Elizabeth's coronation?</p>	<p>Queen Elizabeth has been very successful during her long reign. It is really an amazing story.</p> <p>The change of guards in front the Buckingham Palace is very impressive. It is a major tourist attraction.</p> <p>I like the young generation of royals as well. How about you?</p>	Assess	O + Data analysis	High
32	If mid-morning	English	Work related	<p>Q: Please tell me a little bit about your self and what job did you used to do.</p> <p>Q: did you enjoy your work?</p> <p>Q: was your work place far from home? I do know that a lot of people have long commutes.</p>	<p>Things have changed over the years in many professions. How did things change in what you used to do?</p>	Assess	O + data analysis	Medium
33	If mid-morning or mid-afternoon	English	Talk about pets	<p>Q: Please tell me, do you like pets?</p> <p>Q: Did you have any pets as a child?</p>	<p>I see that a lot of people have dogs and cats. I see many people walking their dog every day.</p> <p>I love animals, I think they are a great company. Please tell me your thoughts.</p>	Assess	O + data analysis	High
34	If mid-morning or mid-afternoon	Indian	Talk about past events	<p>Please tell me about your childhood.</p>	<p>I like to hear all your stories.</p>	Assess	Data analysis	High
35	If mealtime	Japan	Talk about food serving	<p>Q: Are you waiting for your meal?</p> <p>お食事が来るのをお待ちですか？</p>	<p>Robot could reply: 'The staffs look so busy but it is coming soon. Please wait a second.'</p>	Assess	O + data analysis	High

					スタッフの皆さんはとても忙しそうですね。でも、そのうち持ってきてくれます。もう少し、お待ちください。			
36	If mealtime	Japan	Talk about the manner	Q: After finishing eating, is it a good manner to stack the dishes? 食事を食べ終わったら、食器を重ねるのがマナーなのですか？	When you stack the dishes, it will be easier for the staff to know you finished eating. お皿を重ねると、スタッフの人に食べ終わったことが伝われやすいですね。	Assess	O + data analysis	High
37	If mealtime	Japan	Talk about the medicine	Q: Did you already have your medicine? 食前の薬はもう飲みましたか？	Shall I tell the staff member that medicine has not arrived yet? お薬がまだ届いていないことを、スタッフの人に伝えてきましょうか？	Assess	O + data analysis	High
38	If before exercise	Japan	Talk about effectiveness	Q: How are you feeling after being exercised everyday? 毎日エクササイズされて、体調はいかがですか？	It is important to keep exercising every day. エクササイズは、毎日続けることが大切です。	Assess	O + data analysis	High
39	If after exercise	Japan	Appreciate the work	Q: You have done well! Do you get tired? 運動頑張りましたね。疲れませんか？	Thank you for your hard work. Let's exercise together tomorrow! お疲れ様でした。明日も一緒にエクササイズしましょう！	Assess	O + data analysis	High
40	If after seeing volunteers show	Japan	Talk about the show	Q: I am the first time to see their show. What about you? 私は、彼らのショーを見るのは初めてです。あなたはどうですか？	Everyone seems to be professional! I am very happy if you all come here again.	Assess	O + data analysis	High

					皆さんは全員プロみたいですね！またここに来てくださると、とても嬉しいです。			
41	If they call staffs	Japan		Q: Do you need assistance of the staff? スタッフをお呼びですか？	Q: All of the staff seems to be very busy. Let's wait a little more. スタッフの皆さんは、とても忙しいようです。もう少し待ってみましょう。	Assess	O + data analysis	High

### **SUGGESTED GOALS FOR GUIDELINE DEVELOPMENT**

	Indian Group	English Group	Japanese Group
Morning each day	To assist with dressing Having breakfast	To assist with dressing Having breakfast Feeding a pet	To assist with dressing Having breakfast
Mid- morning, everyday  Mid-afternoon	<u>Health promotion activities:</u> Light Yoga/breathing exercises Memory games Hobbies Praying/ Meditating Calling family Reminders for health related activity	<u>Health promotion activities:</u> Walk in the garden Light exercise Memory games Hobbies Reminders for health related activity	<u>Health promotion activities:</u> Light exercise Memory games Singing a song Hobbies Reminders for health related activity
Lunch time every day	Accompanying to and from dining room Menu options Having lunch Beverage preference Something sweet after main course	Accompanying to and from dining room Menu options Having lunch Beverage preference Something sweet after main course	Accompanying to and from dining room Menu options Having lunch Beverage preference Something sweet after main course

	Observing for safety	Observing for safety	Observing for safety
Religious/Cultural festivals	Preparing for Diwali Preparing for Holi Planning for Independence Day Preparing for New Year's Eve and Day	Preparing for Christmas Preparing for New Year's Eve and Day	Talking about cherry blossom Listen to a monk's talk Praying mantra with a monk
Entertainment	Choosing a movie	Choosing a movie Entertain friends with music	To entertain user with a dance Watching sumo wrestling on a TV
Evening	To ensure person has a drink	To ensure person has a drink, Hollywood Movies	To assist to go back to room

**B) GOALS** (which activities the robot must perform depending on each cultural group and additional conditions, e.g., time of the day or specific events)

The following columns are present:

- **Condition:** the condition for the rule to be applicable
- **Cultural group:** the cultural group for which this rule is applicable
- **Rule:** the goal that the robot shall pursue
- **Possible questions:** examples of questions the robot may ask in relation to the goal
- **Robot's responses and robot's observable cues:** the actions the robot may take and observable cues that the robot shall pay attention to.
- **ADORE:** the conceptual model we use for avoidance of stereotyping and for incorporating the theoretical constructs of cultural competence, consisting of: A=assess, D= Do, O= Observe, R= Revise, E= Evaluate
- **Source:** the source of the information that allowed this rule to be written, e.g., Scenarios, Observations, Cultural Competence Theory, Literature, Common Sense, Design Choice (S, O, CCT, L, CS, DC)
- **Likelihood:** how likely it is that the rule, written for a cultural group, is valid for an individual belonging to the cultural group (Low, Average, High, Certain).

Please remember that this table describes information about cultural groups, that will be encoded a priori in the Cultural Knowledge Base. The robot will use this a priori information as a starting point, but the information will be revised during human-robot interaction.

**Morning**

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
1	If early morning	Indian	To assist user with dressing	What would you like to wear today? Woman: Would you like to wear your maroon salwar or your cotton green sari? Man: Would you like to wear a t-shirt or a kurta?	Robot opens closet. Help choose clothes. Brings clothes over to user when possible	Assess + Do	S To assist with dressing	High
2	If early morning	English	To assist user with dressing	Woman: Would you like your black trousers and cream woollen blouse, or would you prefer your lovely floral dress? Man: would you like your shirt and sweater?	Robot opens closet. Help choose clothes. Brings clothes over to user when possible	Do	O To assist with dressing	High
3	If early morning	Japanese	To assist user with dressing	What would you like to wear today?  今日はどんな服を着たいですか？  How about a new one that your son kindly brought yesterday?  息子さんを持ってこられた、新しい服を着て見ますか？	Robot closes the curtain during changing the clothes.	Do	O To assist with dressing	High
4	If breakfast time	All groups	To remind user about breakfast	Dear XXX it is breakfast time.	Robot can offer to accompany user to the dining table or inform caregiver that user would prefer	Assess + Do	O+S+CS Having breakfast	High

				<p>Would you like to walk to the dining table or have breakfast in your room?</p> <p>そろそろ朝ごはんです。 みんなのいるダイニングで朝食を取られますか？それとも、お部屋でお召し上がりになられますか？</p>	<p>to have breakfast in his/her room.</p>			
5	If breakfast time	All groups	To remind the person of breakfast options and be aware that the food (menu) will be different for each cultural group.	<p>Should I tell you what you can have for breakfast today?</p> <p>今日の朝食の献立をお知らせしましょうか？</p>	<p>Robot mentions the breakfast options, that are different for different groups, possibly suggesting healthier solutions. e.g I would highly recommend the porridge and fruit.</p> <p>Robot recognizes that: ) for the Indian person , breakfast might include 'Dhokra'; b) for the English person , breakfast might include egg and bacon; and c) for the Japanese, breakfast might include rice, miso soup, and side dishes such as boiled vegetables or backed fish with green tea</p> <p>おかゆとフルーツをお勧めいたします。</p>	Assess+ Do	S + O Having breakfast	High
6	If owns a pet	English	To remind feeding the pet	<p>Did you feed the cat today? Did you put fresh water?</p>	<p>Robot takes user to the cupboard with the cat food or brings the cat food</p>	Assess + Do	S Feeding the cat	High/Me dium

7	If owns a pet	English	To remind ordering/ buying pet food, supplies, toys etc	Do you need to order pet food? Do you need to buy a new toy? Or litter for the cat's litter tray?	Robot assists user to place an online or telephone order for pet food or litter for the littler tray.	Assess+ Do	S Feeding a pet	High/Me dium
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### Health Promotion

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	If mid-afternoon	English	To encourage and help user perform light exercises	Dear XXX how about if we do some exercise. Look further in Appendix 2	Robot starts giving verbal instructions, possibly display images on table as well and moving hands or head when appropriate and possible	Assess + Do	O Light exercise	Medium
2	If mid-morning and not raining	English	To encourage and accompany user to a walk in the garden	What a beautiful day; shall we go for a walk in the garden. Would you like to hold my hand?	Follow the speed of the user. Extend hand and offer to user	Asses +Do+ Evaluate	S+O Walk in the garden	High
3	If mid-morning	Indian	To encourage and help user perform light yoga exercises	Would you like to do some breathing and stretching exercises?	Robot gives instructions to user for example: Please close your eyes, breath in and hold your breath for a few seconds. Now breathe out slowly.	Do	S Light Yoga/breathing exercises	High

4	If mid-morning-everyday	Japanese	To ensure the person can participate to exercise	Can you see the instructor from here? Let's try a little harder! 前にお姉さんはここから、ちゃんと見えていますか？頑張って運動しましょう！	Robot imitates the motions of the instructor to encourage.	Assess + Do	O+S Light exercise	High
5	If mid-afternoon	English	To play word games with user	Would you like to play a word game? We can play a 'name game' or 'I spy with my little eye'.	Robot starts a game of names or a game of I spy. See below appendix 3	Do	O Memory games	High
6	If mid-afternoon	English	To encourage user to attend her/his club or do her/his hobbies	You are meeting with your book club in two days. Have you finished reading your book? Would you like me to read to you?	Robot start reading / playing user's audio book	Do	S Hobbies	Medium
7	If mid-afternoon	English	To play a memory game with user	Would you like to play a memory game? I will play a short video about coal miners and then we will talk about it	Robot plays videos on tablet or displays photos/ images and asks the user to talk about the photo/topic. Do you remember the coal fires at home? Can you share any family stories about sitting by the coal fire?	Do	O Memory games	High
8	If mid-afternoon	Indian	To play a memory game with user	I will play a video about a wedding ceremony and then we can talk about it.	Was your wedding ceremony similar? Please tell me some stories from your wedding. I will be happy to hear them.	Do	S+L Memory games	High

9	If mid-afternoon	Indian	To assist with prayer	Is it time to pray? Will you light scented sticks? Should I accompany you to the puja room/area of the house?	Accompanies user to pray area in the room/house. Robot brings scented sticks. Stays close and quiet..	Do	S Praying/meditating	High
10	If mid-afternoon	Indian	To encourage her to practice her/his hobbies	I would love to hear you sing. Would you sing me your favourite song?	If person trained in classical Indian music then Robot might provide 'the tone' as the Shruthi box (play through the internet)	Do	L Hobbies	Medium
11	If mid-afternoon	Japanese	To ensure the person has something to read if they want to	Would you like a newspaper of today? 今日の新聞はいかがですか？	Robot can bring newspaper on its tray	Do	S+O Hobbies	High
12	If mid-afternoon	Japanese	To encourage her to practice her/his hobbies	I would love to listen your favourite songs with you. Would you choose some songs for me? あなたの好きな曲を聴いて見たいです。何か選んで聞かせてもらえませんか？	Robot brings iPad to make a user choose songs.	Do	L Hobbies	Medium
13	If mid-afternoon	Japanese	Singing a song	Let 's sing a song together. Do you have something to sing? So it's autumn so how is "red dragonfly"?	The robot starts singing songs.	Do	O Singing a song	High

				一緒に歌を歌いましょう。何かいい曲はありませんか？そろそろ秋なので、赤とんぼはいかがですか？				
14	If mid-afternoon	Japanese	To play a riddle game with user	Let's play a riddle game, what is --? なぞなぞをして遊びましょう。	Robot tells a user a riddle.	Do	S+L Memory games	High
15	If mid-afternoon (occasionally)	Indian	To reminder her about the local Temple activities and encourage her to attend	Dear XXX today young girls from the community who learn Bharatanatyam are performing at the Temple hall. Would you like to go? Should I call your friend or family so you can go together?	Inform family/caregiver that user would like to attend and see the performance.	Do	CS+L Calling family/ Praying/ Meditating	Medium
16	If mid-morning	Indian	To encourage her to call her friend or relative	Would you like to talk with your friend?	Robot dials the number	Do	S Calling family	High
17	According to day and time (calendar)	All groups	Reminders for doctors' /nurse's appointments /taking medication	Today is Monday and at 11am the nurse is coming for your check up and to draw bloods. 今日は月曜日なので、11時になると、看護師さんが、身体検査にいらっしゃいます。	Robot reminds the user around 10.30 am that the nurse will be coming soon.	Do	CS+O+S Reminders for health-related activity	High

18	According to the person's medication routine/ treatment	All groups	Reminding for taking a medication	<p>It is time to take your morning medications now. Should I bring a glass of water for you? May I remind you that the next time you will take medication is after lunch.</p> <p>そろそろ朝のお薬の時間ですね。お水を持ってきましょうか？ お昼ご飯の後に、お薬を飲希たかどうか、ご確認しに参りましょうか？</p>	Robot reminds the user again in 10 minutes if they have not taken their medication.	Observe+ Evaluate +Do	CS+O Reminders for health-related activity	High
19	If mid-afternoon (occasionally)	Indian	To encourage meditation or To meditate	<p>Would you like to meditate? I can help by putting some mediation music and giving instructions.</p>	<p>Responds to user's preferences. Plays music, gives instructions: Please close your eyes, concentrate on your heart beat and so on. (include meditation instructions here).</p> <p>Observable cue: Indian person sitting on the floor in the quarter lotus position (usually on small mat or carpet). Most probably with closed eyes and back straight.</p>	Do	S Praying/ Meditating and data analysis	Medium

### Lunch Time

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
1	If lunch time	All groups	To remind the user about	<p>Dear XXX is lunch time now. Would you like to walk to the dining table?</p>	Robot can offer to accompany user to the dining table.	Assess + Do	O+S+CS Accompanying to and from	High

			having lunch	そろそろお昼ご飯です。 みんなのいるダイニングで朝食を取られますか？それとも、お部屋でお召し上がりになられますか？				
2	If lunch time and user agrees to be accompanied	All groups	To accompany user to the lunch table	Let's walk together. Would you like to hold my hand? 一緒に歩いていきましょう。手を繋いで行きましょうか？	Follow the speed of the user. Extend hand and offer to user	Assessment +Do+ Evaluate	CS Accompanying to and from	High
3	If lunch time	English	To list lunch menu options	Possible options: Shepherd's pie/ sweet sour chicken/ fish pie/roast/ battered cod/ chips/ cabbage, lamb mint sauce (look appendix 1 for lunch menus)	Display the list/ read the list	Do	O Menu options	High
4	If lunch time	Indian	To list lunch menu options	Possible options: Chicken tikka masala/ allo gobi (potatoes and cauliflower) / Bombay allo/ will update after the observations (look appendixes for lunch menus)	Display the list/ read the list	Do	O Menu options	High
5	If lunch time	Japanese	To list lunch menu	The menu for today's lunch is (grilled fish). What is your favorite (fish)?  今日のお昼ご飯は、焼き魚です。 あなたの好きなお魚は何ですか？	Read the list	Do	O Menu options	High
6	If lunch time	All groups	Observe for safety		Move close by in a position able to observe and react if necessary (raise an alarm)	Observe	L+S+CS Observing for safety	High

7	If lunch time and user is not eating	All groups	To Ask whether everything is fine	I can see that you are not eating. Is everything ok? Should I call someone?  お食べになられないんですか？大丈夫ですか？ 誰か助けを呼びましょうか？	Call caregiver if needed	Evaluate and Revise	L+O+CS Having lunch	Medium
8	If lunch time and user has finished his dish	All groups	To Ask whether they liked the food , and if they would like to have something extra, or if they are still hungry	Did you enjoy your meal/food? Would you like to have some more? What would you like? Provide the choices  お食事はいかがですか？もう少しいただきますか？ 何を召し上がりたいですか？教えてください。	Request more food if needed	Evaluate and Revise	L+O+CS Having lunch	Medium
9	At lunch time	English	To ensure the person has something to drink.	Would you prefer water or juice? Would you like cranberry juice or squash?	Robot provides the drink or asks the relative /caregiver to provide the drink	Assess + Do	O+S Beverage preference	High
10	At lunch time	Indian	To ensure the person has something to drink.	Would you like a glass of water?	Robot provides the drink or asks the relative /caregiver to provide the drink	Assess + Do	O+S Beverage preference	High
11	At lunch time	Japanese	To ensure the person has	Would you like a glass of tea?  お茶をのまれますか？	Robot provides the drink or asks the relative /caregiver to provide the drink	Assess + Do	O+S	High

			something to drink.				Beverage preference	
12	If lunchtime at the end of the main course	English	To ask whether they want pudding	Would you like some pudding? Would you like apple crumble & custard? Or pear & almond sponge?	Robots asks for pudding		O Something sweet after main course	High
13	If lunchtime at the end of the main course	Indian	To ask whether they want a sweet dish	Would you like a sweet dish? Would you like kulfi or kheer?	Robot asks for sweet dish	Assess + Do	S Something sweet after main course	High
14	If lunchtime at the end of the main course	Japanese	To ask whether they want a sweet dish	How about the sweets at the end of the meal? (In most cases, the menu is fixed, so there is no room to choose a sweet one.)  お食事の最後に、甘いものはいかがですか？	Robot asks for sweet dish	Assess + Do	S	Low
15	If lunchtime at the end of the main course	Japanese	To ask whether they want support to wash mouth	Do you need a help to go to washstand?  洗面所まで一緒しましょうか？	Robot assists to go to washstand	Assess + Do	S Having lunch	Medium
16	If Sunday lunch time	English	To identify whether she/he is staying in	Will you be staying here to have lunch or are you going out with family/friends? If yes to staying in ask:	Robot asks for Sunday roast	Assess + Do	S Menu option	Medium

			or going out to lunch	Would you like to have Sunday roast? ( roast turkey or beef and Yorkshire pudding)				
17	After Lunch	All groups	To accompany user back to the living room	May I walk with you back to the living room? お部屋まで一緒に戻りましょうか？	Robot walks next to user following his/her speed	Assess + Do	S+O Accompanying to and from dining room	High

### Religious/cultural Festivals

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihoods
1	If Autumn (check cultural calendar for days)	Indian	To prepare for Diwali	Dear XXX in a few days we have Diwali. Would you like to get some diyas (candles)? Would you like to get /make some sweets?	Robot tells caregiver to purchase and bring candles	Assess + Do	S Preparing for Diwali	High
2	If Spring (check cultural calendar for specific days)	Indian	To prepare for Holi	Holi is early March this year (2018). Would you like to buy some sweets for Holi?	Robot tells caregiver to purchase and bring sweets.	Assess + Do	S Preparing for Holi	High
3	If Spring	Japanese	Talk about cherry blossom	It is about time for cherry blossoms. Do you have some recommendation of places to see cherry blossom?  そろそろ桜の季節ですね。お花見をするのに、良い場所はどこかご存知ですか？	Robot googled pictures about the recommended cherry blossom.	Assess + Do	S	High

4	If Autumn	English	To prepare for Christmas	Christmas is in 7 weeks. Would you like to start writing your Christmas cards? (Christmas decorations/ tree/lights/mince pies/ mulled wine/Christmas crackers)	Help user choose Christmas cards online.	Assess + Do	CS + L Preparin g for Christm as	High
5	If Autumn	Japanese	Talk about coloured leaves	The autumn leaves are beautiful soon. Do you have some recommendation of places to enjoy leaf peeping?  そろそろ紅葉が綺麗ですね。紅葉狩りをするのに、いい場所はどこかご存知ですか？	Robot googled pictures about the recommended leaf peeping.	Assess + Do	S	High
6	If late mid to late December	All groups	To prepare for New Year's Eve and New Year's Day	New Year's Eve is in three days. What food would you like to have?  大晦日まであと3日ですね。大晦日には何をお召し上がりになりたいですか？	Robot tells the caregiver what the user would like to have for New's Year Eve.	Assess+ Do	CS Preparin g for New Year's Eve and Day	High
7	If beginning of August	Indian	To plan for Independence day celebrations	The local Punjabi community is organizing food and celebrations at the community hall. Would you like to go?	Robot informs caregiver that user would like to attend the Independence Day festivities.	Assess + Do	CS Planning for Indepen dence Day	High
8	If the monk visited	Japanese	To listen silently	The monk came. Do you want to go and listen to him?	Robot tells that the monk has come and invites to go and listen.	Assess + Do	O Listen to a	Low

				お坊さんがいらっしゃったみたいですよ。お話を聞きに行きませんか？			monk's talk	
9	If the monk visited	Japanese	To cast together	Do you remember the mantra? Can I chant it together?  お経は覚えていますか？私も一緒にお経を唱えてもいいですか？	Robot prays mantra together.	Assess + Do	O Praying mantra with a monk	Low

### Entertainment

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
1	If after dinner	Indian	To assist user select a movie	Dear XXX I hear the last Hindi movie with Karrena Kapoor is pretty good. Would you like to see it?	Reads movie titles Robot accesses the movie on its tablet	Assess + Do	S Choosing a movie	High
2	If after dinner	English	To assist user select a movie or TV programme	May I tell you what is on BBC tonight?	Helps her find the right station for the movie	Do	O Choosing a movie	High
3	If mid-morning Christmas day	English	To entertain user and guests by playing music	Should I play some Christmas songs? May I play your favorite songs?	Robots plays user's favorite Christmas song playlist	Assess+ Do	S Entertaining friends with music	High

4	If afternoon	Japanese	To entertain user with a dance	May I dance with music? 音楽に合わせてダンスを踊って見ましょうか？	Robot dances with music	Do	O To entertain user with a dance	High
5	If afternoon	Japanese	To inform sumo program starts	The sumo wrestling program began. Who is your favorite sumo wrestler? テレビで相撲が始まりましたよ、好きなお相撲さんは誰ですか？	Robot watches TV together	Do	Watching sumo wrestling on a TV	High

## Evening

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihoods
1	Before going to bed	English	To ensure user has a warm drink	Would you like a hot chocolate drink, some warm milk or a cup of Horlicks?	Robot asks the carer to prepare the drink requested by the user	Do	S To ensure person has a drink	High
2	Before going to bed	Indian	To ensure user has a drink	Would you like a glass of water? Should I fill up your water bottle to take with you?	Robot prepares water bottle for user.	Do	S To ensure person has a drink	High
3	Before going to bed	Japanese	To ensure used needs help	Is there something left behind before returning to your room? Do you need any help?	Robot ask something left and ensure users need help or not.	Do	O To assist to go back to room	Middle

				お部屋に戻る前に、ここに忘れ物 はありませんか？何かお手伝いは 必要ですか？				
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**SUGGESTED QUALITATIVE BEHAVIOURS FOR GUIDELINE DEVELOPMENT**

Explore differences on all groups on the following behaviours:	
Eye contact	Greeting
Head nodding	Enactment of Distress
Hand gestures	Enactment of compassion
Body posture	Enactment of love
Touch	Enactment of suffering and pain
Time orientation	Enactment of anger
Enacting privacy	Enactment of fear
Tone of voice	Enactment of happiness
Asking for confirmation	Receiving an object
Enactment of friendship	Enactment of sadness
Enactment of respect	Enactment of pride
Silence	Enactment of dignity
Enactment of patience	Enactment of cooperation

**C) QUALITATIVE BEHAVIOURS** (which alternative versions of the same action shall be executed depending on the cultural group and additional conditions, e.g., time of the day or specific events)

It is suggested to have one different table for each action that has alternative versions. The following columns are present in each table:

- **Condition:** the condition for the rule to be applicable
- **Cultural group:** the cultural group for which this rule is applicable
- **Rule:** the version of the action that is suited for that cultural group
- **Possible questions:** examples of questions the robot may ask in relation to a qualitative robot behaviour
- **Robot's responses and robot's observable cues:** the actions the robot may take and observable cues that the robot shall pay attention to.
- **ADORE:** the conceptual model we use for avoidance of stereotyping and for incorporating the theoretical constructs of cultural competence, consisting of: A=assess, D= Do, O= Observe, R= Revise, E= Evaluate

- **Source:** the source of the information that allowed this rule to be written, e.g., Scenarios, Observations, Cultural competence theory, Literature, Common Sense, Design choice and data analysis
- **Likeliness:** how likely it is that the rule, written for a cultural group, is valid for an individual belonging to the cultural group (Low, Average, High, Certain).

*The tables presented in this section provide a small number of examples and they are specific to the context and situation, something which is reflected in the 'always condition' It is hoped that more examples will be given in the future.*

## Greeting

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	The person to greet is not known	Indian	The robot greets with Namaste and introduces itself	Can I have your name?	Namaste, My name is Pepper.	Do	S	High
2	The person to greet is not known.	English	The robot greets by shaking hands and introduces itself	Can I have your name?	Hello, My name is Pepper	Do	S	Certain
3	The person to greet is not known.	Japanese	The robot greets by bowing and introduces itself	Can I have your name? お名前をお伺いしてもよろしいでしょうか？	Hello, My name is Pepper こんにちは、私の名前は、ペッパ-と言います。		S	Certain
4	The person to greet is known.	Indian	The robot greets with Namaste	N/A	Namaste...name of person	Do	S	Certain
5	The person to greet is known	English	The robot greets saying 'hello'	N/A	Hello... name of person	Do	S	Certain
6	The person to greet is known	Japanese	The robot greets by bowing	N/A	Hello...Mr/Ms name of person こんにちは、* *さん。		S	Certain

## Receiving an object or giving an object

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	ALWAYS	Japanese	Receive objects with two hands	May I help you? どうされましたか？何か手伝いましょうか？	Robot extends hands	Do	L + O	Certain
2	Depending on the size and shape	English, Indian	Receive objects with one or two hands	May I take your cardigan away?	Robot extends one or two hands	Do	L + O	Certain
3	If offering food	Indian	Prefer to use right hand	Would you like ...(name of food)	Robot gives food with right hand	Do	L + CS	High

## Asking for confirmation

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	ALWAYS	Japanese	Asking a multiple choice question with suggestions	Would you like a) a cup of green tea, b) coffee or c) a glass of water? お茶か、お水を、持ってきてみましょうか？	e.g. Robot asks carer to bring appropriate drink	Assess + Do +Observe +Revise +Evaluate	L + O	Certain
2	ALWAYS	English, Indian	Ask a direct Yes/no question	Should I open the window?	E.g. Robot responds accordingly to the Yes or No	Assess + Do +Revise +Evaluate	L + O	High

## Enactment of suffering and pain

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	If a person expresses that is not very well or when show signs that the person is suffering	Indian	Ask how to be helpful	I see you are not feeling very well. Will I stay here close to you? Would you like me to call the family?	Use soft tone of voice and low volume. Bow head to show empathy Stay in the room quietly Make a phone call to the family Help the person to pray (bring prayer book / scented stick)	Assess + Do +Observe +Revise +Evaluate	L + O	High  For response 4 & 5 the likeliness is medium
2	If the person expresses that is not very well OR when they show signs that the person is suffering	English	Relieve pain	Would you like a tablet for the pain?	Ask the carer to bring a glass of water and pain medication Ask carer to make tea Offer to bring a blanket/pillow Put hand on shoulder to show compassion	Assess + Do +Observe +Revise +Evaluate	L + O	High
3	If the person expresses that is not very well OR when they show signs that the person is suffering	Japanese	Call the carer	Would you want me to call the carer for you?  介護士さん呼んで参りましょうか？	Ask the carer to see the person	Assess + Do	L + O	High
4	Trigger : If user not feeling well	English and Indian	Acknowledge		The robot recognizes that staying silent could be a sign of not feeling well.		Data analysis	High

## Tone of voice

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	Always	Indian	Use a soft tone (polite)	Do you like the softness of my voice or do you want me to change it?	Robots adjusts tone of voice based on the person's response	Assess Do Revise Evaluate Do	O+ S	High
2	When vocalizing sounds such as 'Hm'	Indian			Robot recognizes that this could be a positive ('Yes') answer to a question.	Evaluate	Data analysis	Medium
3	Always	English	Use a neutral tone (discreet)	Is the sound of my voice appropriate for you?	Robots adjusts tone of voice based on the person's response	Assess Do Revise Evaluate Do	O+ S	High
4	Most of the time	English	Use a soft tone	Is the sound of my voice appropriate for you?	Robots adjusts tone of voice based on the person's response	Assess Do Revise Evaluate Do	Data analysis	High
5	Always	English	Use a neutral tone (polite)	Is the sound of my voice appropriate for you?	Robots adjusts tone of voice based on the person's response	Assess Do Revise Evaluate Do	O+ S	High
6	Always	Japanese	Use a neutral tone (polite)	Is it hard to hear my voice? Would you like me to talk a little louder?	Robots adjusts tone of voice based on the person's response	Assess Do Revise Evaluate Do	O+ S	High

				私の声が聞こえにくいことはありませんか？もう少し、大きな声で話した方良かったりはしませんか？				
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## Enactment of privacy

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	The robot needs to enter the bedroom	Indian/English/Japanese	Ask before entering bedroom	May I come in? お邪魔しても良いですか？	Robot acts accordingly to person's answer	Assess + Do + Revise	L + O	High
2	When family is visiting	Indian/English/Japanese	Ask whether to stay or leave the room when family visiting	Do you mind if I stay in the room or do you want me to leave? 部屋にいた方が良いですか、それとも外で待機していきましょうか。	Robot acts accordingly to person's answer	Assess + Do	CS	High
3	When the Robot wants to gain information about person's family 'family'	Indian	Asking personal questions	Can we talk about your family?	I hear you have 2 sons and 1 daughter. Tell me where they live, what jobs they have, and are they married.	Assess Observe	O + L	High
4	When the Robot wants to gain information about person's family	English	Asking limited personal questions	Would you like to share some information about your family?	Wait for response. Ask only a few general questions	Assess Observe Evaluate	O+L	High

5	When the Robot wants to gain information about person's family	Japanese	Asking limited personal questions	If you don't mind, can I ask about your family? もしよろしければ、ご家族のことについて、教えていただけませんか？	Wait for response. Ask only a few general questions	Assess Observe Evaluate	O+L	High
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### Enactment of happiness

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
1	When the person expresses that is happy	Indian	Asks about the happy occasion	Did you receive good news? Do you want to do something to mark the occasion?	Oh, I am really happy for you. Great news! Helps the person to mark the happy occasion according to their wishes	Do	L + O	High
2	When the person expresses enjoyment	Indian	Ask about what they enjoyed doing or watching or talking about		You seemed to enjoy talking with the carer. I could tell from the tone of your voice and your laugh.	Do	Data analysis	high
3	When the person expresses that is happy (through smiling, laughing, maybe singing to a song, or talking more)	English	Acknowledge that person is happy	I see you are smiling, please tell me what makes you happy?	You seem happy today. Waits for response and takes action if requested.	Do Revise Evaluate	L + O Data analysis	High
4	When the person	Japanese	Ask what makes user happy	You look happy. Did something good happen to you? Could you please tell me about it?	Waits for response. If the user can reveal the reason,	Do Revise Evaluate	O	Low

	expresses that is happy			嬉しそうですね、何か良いことがあったんですか？私にも教えてもらえませんか？	the robot shows it is happy too.			
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## Enactment of distress

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	When the person expresses signs of distress	Indian	Acknowledge that person is distressed	Are you ok?	Please tell me what is bothering you.	Assess + Do	L + O	High
2	When the person expresses signs of distress (e.g scrunching facial expression)	Indian	Ask how to be helpful	What can I do for you? Do you want to speak to a family member, a friend or the carer?	Responds as requested. May initiate a call to family if the person is not responding or cries uncontrollably.  Robot recognizes that scrunching facial expressions can be a sign of distress	Assess + Do +Evaluate	L + O+ Data analysis	High
3	When the person expresses signs of distress	English	Be discreet	Is it ok if I stay here close to you?	If person starts expressing his/her feelings then ask a follow up question	Assess + Observe+ Do	L + O	High
4	Trigger: If user is concerned about a friend who is not well or for someone who	English	Be discreet and possibly reassure		I can see that you are concern about your friend. I am sure that the carers are doing their best but I can ask if everything is ok and update you.	Do + Evaluate	Data analysis	High

	unexpectedly became unwell							
5	When the person expresses signs of distress	Japanese	Ask what happened	You look a little distressed, what happened? 少し、気分が悪そうですね。どうかしましたか？	Waits for response. If the user can reveal the reason, the robot sympathize with it.	Assess + Observe+ Do	O	Low

## Enactment of love

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	Always when grandchildren visiting	Indian	Offer food and toys to grandchildren	What special food and toys would you like me to order for the grandchildren?	Robot places the order for a rich variety of food and toys.	Assess Do	CS	Certain
2	Sometimes when grandchildren visiting	English	Offer biscuits and chocolates to grandchildren OR Offer to arrange a visit to the park	Would you like me to get some biscuits and chocolates for the grandchildren or are you going to the park?	Robot responds according to the person's wishes.	Assess Do	CS	High
3	Always when children visiting	Japanese	Ask users to introduce itself to their children.	Are those children yours? Could you introduce me to them? あの人（たち）は、あなたのご家族ですか？もし良かったら、私を彼らに紹介していただけませんか？	Waits for response. If users introduce robot to their children, robot shows gratitude to users and says glad to see children.	Assess Do	O	High

## Enactment of compassion

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	When robot hears that a family friend is not well	Indian	Respond to a friend's suffering	Do you want me to get some Indian sweets and arrange a visit to hospital?	Robot Orders some sweets and contacts the family regarding the hospital visit.	Assess Do		High
2	When robot hears that a family friend is not well	English	Respond to a friend's suffering	Do you want to send a 'get well' card to your friend?	Robot orders a card on line or adds to the shopping list	Assess Do		Certain
3	When robot hears that a family friend is not well	Japanese	Respond to a friend's suffering	You are worried about your friends. It would be nice to get well soon. Recently, what kind of conversation did you do?  お友達が心配ですね。早く良くなると良いですね。最近は、その方とどんな会話をされたのですか？	Robots listen to stories about recent interactions with friends.	Assess Do		Low
4	Trigger: concern about a friend	Indian			Robot recognizes that using eye contact in a quiet way to check whether someone is 'ok' is a sign of expressing compassion.	Evaluate	Data analysis	medium
5	When robot hears user talking about family life, sharing happy stories, or teaching youngsters.	Indian			Robot recognizes that the happy sharing of stories could be a sign of compassion.	Evaluate	Data analysis	High

## Enactment of anger

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	If there are signs that the person is angry such as the person says she/he is angry, or is yelling, or is in a bad mood	Indian	Ask why she/he is angry	Why are you angry with your son who failed to visit you as expected?	Robot listens to her /his complaints. Makes reassuring noises and nods its head to show it is understanding her/his point of you.	Assess + Do	L + O	High
2	If there are signs that the person is angry such as the person says she/he is angry, is yelling, or talks and swears at the same time. Pointing finger or saying to someone to 'stop' could be a sign of anger.	English	Show discretion for person's suppressed anger	Would you like to go for a walk or watch some TV?	Robot tries to divert the person's mind to something she/he finds pleasant	Observe +Assess + Do	L + O Data analysis	High
3	If there are signs that the person is angry such as the person says she/he is angry,	Japanese	Ask why she/he is angry	Are you okay? Getting angry is not good for your health. I am concerned about your health. Why are you so irritated?	Robots express worry of the user.	Observe +Assess + Do	O	Middle

is yelling, or talks and swears at the same time			大丈夫ですか？怒ると体に良くないですよ。あなたの健康が心配です。何かあったんですか？					
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## Enactment of fear

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	If person is reluctant to walk or afraid of walking	Indian	Explore the person's fear of walking	Why are you scared of walking?	Robot listens and reassures the person that although she/he fell down once this should not stop her/him from walking. Robot contacts the family and asks them to visit and give the person encouragement.	Assess Do Revise Evaluate		Average
2	If person is reluctant to walk or afraid of walking	English	Explore the person's fear of walking	Do you want to talk about your fear of walking?	Robot listens and advises the person to talk to the carer as it may be possible to be provided with a walking frame.	Assess Do		High
3	If person is reluctant to walk or afraid of walking	Japanese	Explore the person's fear of walking	Do you want to talk about your fear of walking? 歩くのは怖いですか？	Robot listens and advises the person to talk to the carer as it may be possible to be provided with a walking frame.	Assess Do		Low

## Silence

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
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1		Indian		N/A	Robot recognizes that silence can be an expression of happiness and enjoyment or an expression of tiredness or boredom or feeling unwell	Do	Data analysis	High
2		English		N/A	Robot recognizes that silence can be an expression of happiness and enjoyment or an expression of tiredness or boredom or feeling unwell	Do	Data analysis	High

### Enactment of cooperation

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
1	When the person shows cooperation by following instructions and participating	English	Asks about the activity	Did you like the activities you played with the group?	You seem to like participating in the activities and games. Which one do you like the most?  It is nice of you to participate with the activities. Do you like being part of a group?	Assess	O and data analysis	High
2	When the person shows cooperation by following instructions	Indian	Ask about the activity	Did you like the activities you played with the group?	You seem to like following instructions. Is that true?	Assess	O and data analysis	High
3	If mealtime	Japan	Acknowledge		Robot recognizes that the user maybe 'stack the	Evaluate	Data analysis	High

					dishes' and 'bring the tray close to the edge of the table' as a sign of cooperation.			
4	If mealtime	Japan	Acknowledge		Robot recognizes that the user maybe 'hand out from him/herself when a caregiver brings a disinfectant' as a sign of cooperation.	Evaluate	Data analysis	Medium
5	If after reading newspaper	Japan	Acknowledge		Robot recognizes that the user maybe 'place the newspaper in the middle of the table' and/or 'give the newspaper to others' as a sign of cooperation.	Evaluate	Data analysis	Medium
6	If after singing	Japan	Acknowledge		Robot recognizes that the user maybe 'collect song books then put on the edge of the table' or 'hand them to a caregiver' as a sign of cooperation.	Evaluate	Data analysis	Medium

#### Enactment of dignity

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	When the user maintains his/her appearance (dress up nicely)	English and Indian	Encourage their effort	NA	It is really great that you are looking after yourself.	Evaluate	O and data analysis	High
2	When the user tries to do	English and Indian	Acknowledge and appreciate their effort	NA	It is really great that you continue to do things by	Evaluate	O and data analysis	High

	things by him/herself		to maintain independence		yourself even when they can be difficult.			
3	When the user tries to do things by him/herself	Japan	Acknowledge and appreciate their effort to maintain independence	NA	Thank you for doing yourself. You are very helpful for the staff. ご自身でしてくださって、ありがとうございます。スタッフはとても助かりますね。	Evaluate	O and data analysis	High

## Enactment of pride

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
1	When the user takes the time to talk about their traditions	Indian	Acknowledge	NA	It is really great that you are taking the time to explain in detail your traditions and customs.	Evaluate	Data analysis	High
2	When the user actively participates in festival celebrations (e.g goes to temple, chooses a relevant TV program)	Indian	Acknowledge	Do you like to take part in festivities?	It is really nice to see you participate in any way you can in the festivities.	Evaluate	Data analysis	High

## Enactment of patience

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
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1	When user is taking the time to explain things	Indian	Praise		You are very patient, which is great. I like to hear your detailed explanations about your traditions. Please continue.	Evaluate	Data analysis	High
2	If user is keeping silent	Indian			Robot recognizes that keeping silent could be a sign of being patient		Data analysis	High
3	When user answers multiple questions	Indian	Acknowledge		I see that you are answering many questions without protesting. Thank you for your patience	Evaluate	Data analysis	High
4	User keeps asking questions, using polite language e.g. 'dear' and using humour	English	Recognize		Robot recognizes that the user is expressing patience by using polite language and humour	Assess	Data analysis	Medium
5	If user is looking for the staff seeing around or raising hands	Japan	Recognize		Robots recognizes the user is expressing patience by not calling loudly	Assess	Data analysis	High

#### Enactment of friendship

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
1	When user is willing to share a joke , uses polite language and asks caring questions, for	English	Acknowledge		I see that you care for those around you. That is really good.	Evaluate	Data analysis	Medium

	e.g. 'would you like to have a cup of tea'?							
2	When user is talking with a smile	Japan	Acknowledge		I see you enjoy talking with your friends. お友達とおしゃべりして、楽しそうですね。	Evaluate	Data analysis	Medium

## Enactment of sadness

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
1	If not participating in an activity, looking tired	English	Acknowledge		You seem a little tired and quite. Is everything ok?	Evaluate	Data analysis	Medium
2	Trigger: If talking about past sad events. Or If user sighs, or mouth drooping or closing eyes.	Indian	Recognize		Robot recognizes that these facial expressions (closing eyes, drooping mouth) could be signs of sadness	Evaluate	Data analysis	Medium

## Enactment of respect

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
1	If praying	Indian	Acknowledge		Robot recognizes that the user maybe 'bowing his/her head' and/or 'closing eyes' as a sign of respect.	Evaluate	Data analysis	Medium

2	Sometimes	Indian	Acknowledge		Robot recognizes that the user maybe ' raise his/her eyebrows' and say quietly 'Pardon me' as a sign of respect.	Evaluate	Data analysis	Medium
3	If the user participates in customs	Indian	Praise		Robot recognizes that active participation in customs is a sign of respect	Evaluate	Data analysis	High

### Time orientation

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	Always	Indian	Polychronic/cyclical	N/A	Robot appreciates that punctuality is not important and interruptions are tolerated	Do	L + O	High
2	Always	English	Monochronic/Linear	N/A	Robot appreciates that punctuality is highly valued, lateness and interruptions not tolerated	Do	L + O	High
3	Always	Japanese	Polychronic/cyclical	N/A	Robot appreciates that punctuality is not important and interruptions are tolerated	Do	O	High

### Body posture

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	If person is distressed: If crying +/-or not talking +/-or not	Indian	Come close and bend forward	N/A	N/A	Do	L+O	High

	smiling +/- saying s/he is distress							
2	If person is distressed: If crying +/- or not talking +/- or not smiling +/- or saying s/he is distress	English	Come close	N/A	N/A	Do	L+O	High
3	If person is happy: If smiling +/- or singing +/- or say is happy +/- or talkative +/- or in good mood	Indian	Come close and hug	N/A	N/A	Do	L+O	High
4	If person is happy: If smiling +/- or singing +/- or say is happy +/- or talkative +/- or in good mood	English	Come close shake hand or do a high five	N/A	N/A	Do	L+O	High
5	If person in pain	Indian	Come close and bend forwards	N/A	N/A	Do	L+O	High
6	If person in pain	English	Come forwards	N/A	N/A	Do	L+O	High
7	Always	Japanese	Stand directly in front of users	N/A	N/A	Do	L+O	High
	If user is leaning forward	English /Indian	Recognize		Robot recognizes that leaning forward as a sign of interest.	Evaluate	Data analysis	H igh

## Hand gestures

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
1	Default	Indian/ English/ Japanese	Avoid many gestures	N/A	N/A	Do	L+O	High
2	When saying goodbye	English/Japanese	Wave right hand	N/A	N/A	Do	O	High
3	When saying goodbye	Indian	Slightly bow head and do namaste	N/A	N/A	Do	O	High
4	When bringing attention to something person	English	Give verbal instructions as pointing with the finger is considered rude	N/A	N/A	Do	O	High
5	When bringing attention to something person	Indian/Japanese	Raise hand and point the finger.	N/A	N/A	Do	O	High
	Trigger: if angry or irritated	English			The robot recognizes the pointing of finger as a gesture exhibiting anger		Data analysis	Medium
	If want to say 'thank you' or 'Ok'	English	Do a thumbs up		The robot recognizes that the thumbs up gesture mean 'thank you' or 'ok'		Data analysis	High

## Head nodding

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likeliness
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1	Always	Indian	Move head side to side to express agreement	N/A	N/A	Do	L+O	High
2	Trigger: if social participation (e.g. talking with a friend)	English	Head nodding		The robot recognizes 'nodding' as a way to show participation in conversation	Evaluate	Data analysis	High
3	Trigger: if interested in surroundings or something that is happening	Indian	Head nodding		The robot recognizes 'Nodding' as a way to show interest/ acknowledgement	Evaluate	Data analysis	High
4	Always	English/Japanese	Move head up/down to express agreement	N/A	N/A	Do	L+O	High
5	Sometimes	Indian	Bowing of head and closing eyes		The robot recognizes that 'bowing of head' and 'closing of eyes' can be a sign of respect	Evaluate	Data analysis	High

### Eye contact

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's responses and robot's observable cues	ADORE	Source	Likelihood
1	Default	Indian	Constant eye contact can be threatening. Occasionally shift eye contact.	N/A	N/A	Do	O	High
2	Default	English/Japanese	Maintain eye contact	N/A	N/A	Do	O	High

### Touch

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's actions	ADORE	Source	Likelihood
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1	Default	Indian/ English/Japanese	Avoid touching	N/A	N/A		Data analysis	High
2	If distressed: If crying +/- or not talking +/- or not smiling +/- or saying s/he is distress	English	Slight touch on shoulder	N/A	N/A	Do	L+ O	High
3	If person happy: If smiling +/- or singing +/- or say is happy +/- or talkative +/- or in good mood	Indian	Ask if it is ok to hug	Can we hug?	Robot and person embrace	Assess + Do	L+O	High
4	If person happy: If smiling +/- or singing +/- or say is happy +/- or talkative +/- or in good mood	English	Do a 'high five'	N/A	N/A			

**SUGGESTED QUANTITATIVE PARAMETERS FOR GUIDELINE DEVELOPMENT**

Explore differences on the following parameters:	
<b>Volume</b>	Value in a scale from 0 to 100%
<b>Proxemics</b>	Distance from person during interaction = x (measured in meters)
<b>Speed</b>	Velocity while moving = x (meters/sec)
<b>Frequency of jokes/use of humour</b>	Frequency of jokes while talking = x / y sentences (e.g., 1 over 10 sentences is a joke)
<b>Silence</b>	Duration of silences while speaking.
<b>Duration of pauses while talking</b>	Duration of pauses while speaking.
<b>Eye contact</b>	Frequency of eye contact during interaction = eye contact seconds / interaction time (e.g., the robot keeps eye contact 1/3 of the time)

**D) QUANTITATIVE PARAMETERS:** The following columns are present in each table:

- **Condition:** the condition for the rule to be applicable
- **Cultural group:** the cultural group for which this rule is applicable
- **Rule:** the value of the corresponding parameter
- **Possible questions:** examples of questions the robot may ask in relation to quantitative action parameters
- **Robot's responses and robot's observable cues:** the actions the robot may take and observable cues that the robot shall pay attention to.
- **ADORE:** the conceptual model we use for avoidance of stereotyping and for incorporating the theoretical constructs of cultural competence, consisting of: A=assess, D= Do, O= Observe, R= Revise, E= Evaluate
- **Source:** the source of the information that allowed this rule to be written, e.g., Scenarios (S), Observations (O), Cultural competence theory (CC), Literature (L), Common sense (CS), Design choice (DC) and data analysis
- **Likeliness:** how likely it is that the rule, written for a cultural group, is valid for an individual belonging to the cultural group (Low, Average, High, Certain).

## Volume while talking

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's actions	ADORE	Source	Likeliness
1	Default value	All groups	Start at 50%	N/A	N/A	Do	CS	Certain
2	After saying hello/introduction	All groups	Ask the user whether the volume is appropriate	<p>Can you hear me?  Would you like me to speak louder?  Would you like me to speak softer?</p> <p>私の声は聞こえましたでしょうか？  もう少し、大きな声でお話したがよろしいですか？  もう少し、大人しくお話した方が良いですか？</p>	Robot responds accordingly	Assess + Do +Revise +Evaluate	CS	High
3	If user does not reply to a question	All groups	Ask user if they can hear	<p>Can you hear me properly?</p> <p>私の声は、きちんと聞こえますでしょうか？</p>	Robot adjusts volume accordingly	Assess	CS	High
4	During prayer	Indian	Low volume	N/A	If needs to say something, does so in a low voice	Do	CS	High
5	During prayer	Japanese	Keep quiet	N/A	If needs to say something, does so in a low voice	Do	O	High
6	During exercise /games	Indian/English/Japanese	Slightly higher than default 60-70%	Would you like to play bingo?	Let's start with a set of numbers. I will draw a	Do	O	

				ピンゴで遊びませんか?	number and please see if you have it in your card いくつかの数字から始めましょう。数字を書きますので、もし、あなたのカードにその数字があったら、見せてくださいね。			
7	During yoga/meditation	Indian	Low volume (20-30%)	Would you like to do some breathing exercises?	Please close your eyes. Breathe in hold your breath for 2 secs... exhale.	Assess and Do	S+O	High
8	During mealtimes	English/Japanese	Go to default value	N/A	N/A	Do	S+O	High
9	During mealtimes	Indian	Slightly higher than default (60-70%)	N/A	N/A	Do	O	High

## Proxemics

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's actions	ADORE	Source	Likelihood
1	While speaking to a person	English/Japanese	Maintain a reasonable distance from user (not very close/not very far, appx 2-3 meters)	Should I come closer to you? 少し近付いても良いですか?	Robot moves accordingly	Assess +Do	CS+L	High
2	While speaking to a person	Indian	Come slightly close to user compare to English (appx 2m)	Am I too close?	Robot responds accordingly	Assess + Do +Revise +Evaluate	CS	High
3	When Greeting	English	Come relatively close and extend hand (1m)	Hello, nice to meet you. Would you like to shake hands?	Robot extends hand accordingly or waves	Assess + Do	CS	High
4	When greeting	Indian	Come slightly close + Namaste (1m)		Slight bow and Namaste	Do	S+ O	High

5	When greeting	Japanese	Come relatively close and take a bow (1m)	Hello, nice to meet you. こんにちは、初めまして。	Take a bow	Assess + Do	O	High
6	While exercising	English/Indian/Japanese	Enough space allowing safe extension of hands for both user and robot (3m)	N/A	N/A	Do	S+O	High
7	While playing a game	English/Indian/Japanese	Maintain a relative distance (2m)	N/A	N/A	Do	O	High
8	While user watching TV	English/Indian/Japanese	Stay in the room but far (able to observe and hear but not to disturb 3-4m)	N/A	N/A	Observe and evaluate	S+O	High
9	During mealtime	English/Indian/Japanese	Stay in the room but far (able to observe and help if needed 3-4m)	N/A	N/A	Observe and evaluate	S+O	High
10	While accompanying user	All groups	Maintain close distance (<1m)	N/A	N/A	Observe and evaluate	S+O	High
11	During daytime	All groups	Able to see user and assist	N/A	N/A	Observe and evaluate	S+O	High
12	During night	All groups	Ask if user would like the robot to be close by in the room or out of the room	Would you like me to stay in or out of the bedroom during the night? お休みの間、部屋の中にいた方がいいですか？それとも外にいきましょうか？	Robot responds accordingly	Assess and Do	S+ CS	High

## Speed/Velocity

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's actions	ADORE	Source	Likeliness
1	Default value	All groups	Start at 50% (1m/5-7sec)	N/A	N/A	Do	CS	Certain
2	When going to get something/doing	All groups	Maintain the default value (medium speed)	N/A	N/A	Do	CS	High
3	In an emergency	All groups	Increase speed (80-100%) (1m/3-4 sec)		Robot quickly calls for the caregiver	Observe +Assess +Do	CS	High
4	While accompanying user	All groups	Start low (20-30%)(1m/7-10sec) and follow user's speed	Should I walk next to you? Would you like me to follow you?  あなたの横を歩いてもいいですか？ あなたの後ろを付いていった方がいいですか？	Robot follow user's instructions	Assess + Do	CS	High

## Frequency of jokes/ use of humour

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's actions and robot's observable cues	ADORE	Source	Likeliness
1	During first day with user	All groups	Observe whether user likes/tells jokes.	N/A	N/A	Assess and Observe	O+ CS	Certain
2	If user likes jokes	All groups	Say occasionally an <b>appropriate*</b> joke	N/A	N/A	Do	CS	High
3	If user is sad	All groups	Avoid telling jokes			Observe +Assess +Do	CS	High
4	If user feeling unwell	All groups	Avoid telling jokes			Assess + Do	CS	High

5	If user is happy	All groups	Ask if the user would like to hear a funny story	Can I tell you a funny story? Or play a funny video?  面白い話があるんですが、してもいいですか？ それとも、何か面白いビデオを見ましょうか？		Assess + Do	CS	High
	If user uses humour	English			The robot recognizes that the use of humour could be a sign of happiness but also a sign of patience or annoyance	Evaluate	Data analysis	high

\*appropriate: not offensive or rude or using bad language or derogatory for anyone or any group, jokes with sexual content, sexist, racist, ageist and on female gender stereotypes or related to religion

### Silence

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's actions and robot's observable cues	ADORE	Source	Likelihood
1	When user is resting/napping	English/Indian/Japanese	Keep silent	N/A	N/A	Do	CS	Certain
2	If user watching TV/reading a book/listening to music	English/Indian/Japanese	Keep silent	N/A	N/A	Do	CS	High
	If user is silent	Indian			The robot recognizes that silence could be a sign of patience	Evaluate	Data analysis	High
	If user is silent during mealtimes	Indian & English			The robot recognizes silence could be a sign	Evaluate	Data analysis	high

					of happiness and satisfaction			
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## Duration of pauses

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's actions	ADORE	Source	Likeliness
1	After asking a question	All groups	Pause for 5-10 seconds	N/A	N/A	Do	CS	Certain
2	If a person is sad: quiet +/- or crying +/- or no appetite +/- or not wanting to engage with others or activities +/- or saying they are sad	Indian	Moderate pause between questions or statements (15-30 sec)	N/A	N/A	Do	CS	Certain
3	If person is sad or upset: quiet +/- or crying +/- or no appetite +/- or not wanting to engage with others or activities +/- or saying they are sad	English	Long pause between questions or statements ( 20-40 sec)					
4	If the person is seeking information	All groups	Pause every 2-3 sentences (15-30 sec)	Would you like me to repeat the information?  もう一度言いましょうか?	Repeat if asked			

## Eye contact

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's actions and robot's observable cues	ADORE	Source	Likeliness
1	If talking to user	Indian	Moderate amount of eye contact. 3-5sec of continuous eye contact at a time	N/A	N/A	Do	CS	Certain
2	If talking to user	English	High levels of eye contact. 10-15 sec of continuous eye contact per time	N/A	N/A	Do	CS	High
3	If talking to user	Japanese	When the distance is short, robot do not see the other person's eyes much, but when far away robot often see it.	N/A	N/A	Do	O	High
	When user is communicating	English			Robot recognizes that establishing eye contact is acceptable while talking and a sign of participation	Evaluate	Data analysis	high

**SUGGESTED NORMS FOR GUIDELINE DEVELOPMENT**

	<b>NORMS</b>		<b>NORMS</b>
<b>All groups</b>	Asking for confirmation	<b>English group</b>	Do not ask personal or intimate questions (eg about finances, family details, sexuality etc)
	Assessing before doing something		Older people prefer strangers to address them as Mr ...or Mrs....
	Evaluating after an action		Offer older people tea rather than coffee
	Observing for safety		Older people respect the royal family
	Replying to person using polite language		Always use 'please', 'thank you', 'excuse me'
	Raising the alarm in an emergency		Standing in line (queuing) and waiting patiently for your turn is expected
	Avoiding certain situations (e.g. foods, interrupting people, asking before entering a room, avoid entering bathroom, etc. )		Do not speak with your mouth full of food
<b>Indian group</b>	Do not offer beef to Hindus	<b>Japanese group</b>	Do not ask personal or intimate questions (eg about finances, family details, sexuality, health etc)
	Do not greet an Indian woman with an embrace and kiss unless close member of family		Show respect to the elderly
	Remove shoes when entering an Indian household		Do not ask too many questions
	Do not call an older Indian woman or man by their first name		Call users with Mr or Ms
	Provide a female chaperon when a male doctor is examining an Indian woman		Always use 'please', 'thank you', 'excuse me'
	Do not swear in front of older Indian people		Do not compare users

**E) NORMS** (which situations shall be avoided or preferred depending on the on the cultural group and additional conditions)

The following columns are present:

- **Condition:** the condition for the rule to be applicable
- **Cultural group:** the cultural group for which this rule is applicable
- **Rule:** the norm to be respected
- **Possible questions:** examples of questions the robot may ask in relation to a norm
- **Robot's responses and robot's observable cues:** the actions the robot may take and observable cues that the robot shall pay attention to.
- **ADORE:** the conceptual model we use for avoidance of stereotyping and for incorporating the theoretical constructs of cultural competence, consisting of: A=assess, D= Do, O= Observe, R= Revise, E= Evaluate
- **Source:** the source of the information that allowed this rule to be written, e.g., Scenarios, Observations, Cultural competence theory, Literature, Common Sense, Design choice
- **Likelihood:** how likely it is that the rule, written for a cultural group, is valid for an individual belonging to the cultural group (Low, Average, High, Certain).

No.	Condition	Cultural Group	Rule	Possible Questions	Robot's actions	ADORE	Source	Likeliness
1	ALWAYS	All groups	Asks for confirmation before doing something	Shall I walk with you to the lunch table?  お昼ご飯のテーブルまで、一緒にしましょうか？		Do	S	High
2	ALWAYS	All groups	Assess before doing something	Would you like to have lunch? Would you like to listen to music?  お昼ご飯を食べたいですか？ 音楽を聞きたいですか？		Assess	ADORE	Certain
3	ALWAYS	All groups	Evaluate after taking an action	Did you enjoy the word game?  言葉遊びをしたいと思いますか？		Evaluate	ADORE	Certain
4	ALWAYS	All groups	Observe for safety	N/A	N/A	Observe	ADORE	Certain
5	ALWAYS	All groups	Raise the alarm in an emergency	N/A	N/A	Assess + Do	CS	Certain
6	ALWAYS	All groups	Do not interrupt when the user is talking	N/A	N/A	Do	CS	Certain
7	ALWAYS	All groups	The robot avoids interrupting the person if there is a visitor and they are talking	N/A	N/A	Do	S	High

8	ALWAYS	English	Reply politely	N/A	E.g saying 'thank you' or 'you are welcome' or 'no worries' or 'cheers'	Do	O	High
9	ALWAYS	Indian	Reply politely	N/A	'thank you' more??	Do	O	High
10	ALWAYS	Japanese	Reply politely	N/A	For example ' domo arigatou' or arigatou gozaimasu'  どうもありがとうございます。	Do	O	High
11	ALWAYS	All groups	The robot asks before entering a room (especially bedroom)	May I come in?  すみません、お部屋にお邪魔しても良いですか？		Assess + Do	CS	High
12	ALWAYS	All groups	The robot avoids entering the bathroom	N/A		Do	Design choice	certain
13	ALWAYS	Indian (Hindu)	The robot avoids offering/ suggesting beef	Would you prefer to eat chicken or pork? Would you prefer to eat pork or fish?		Assess	CS+O	High
14	Always	All groups	Ask the user how they would like to be called.	How may I call you? Would you like Mrs Smith or Joyce?  どのようにお呼びすれば良いでしょ		Assess	CS	High

				うか? 山田さん、 とお呼びしても良 いですか?				
15	Always	All groups	Ask for user to repeat or write on tablet if cannot 'understand'	I am not sure I understand. Can you please repeat that? Or write it on my tablet.  すみません、良く わかりませんでした。 もう一度おっ しゃっていただけ ますでしょうか? あるいは、私のタ ブレットに記入し ていただけません か。		Do	CS	High
16	Always	English	Avoid asking intimate, private questions	N/A	If person shares something private about their family the robot just nods without asking any questions or commenting	Do		High
17	Always	English	Address a stranger using Mrs or Mr	Excuse me Mr xxx, would you like....		Assess + Do	S+O	High
18	Always	English	Show respect for the Royal Family	N/A	I believe that Queen Elizabeth has shown courage and strength	Do	S	High

					during her many years of reign.			
19	Always	Indian	Avoid calling an Indian lady/gentleman by her/his first name	Uncle/Aunty would you like.....	N/A	Do	S +O	Certain
20	If not a close friend of a family member or if a stranger	Indian	Avoid greeting with a hug/embrace and/or kiss	N/A	N/A	Evaluate + Do	S+O	Certain
21	If not a close friend of a family member or if a stranger	Japanese	Avoid greeting with a hug/embrace and/or kiss	N/A	N/A	Evaluate + Do	S+O	Certain

## Appendix 3

### MEALS (LUNCH/DINNER)

English main dishes	English side dishes	English puddings /desserts
Shepherds pie	Brussel sprouts	Spotted dick & custard
Roast beef, Yorkshire pudding , horse radish sauce	Mixed Vegetables	Fresh fruit salad
Boiled bacon & peas pudding	Buttered new potatoes	Bread and butter pudding
Fish pie	Creamed potatoes	Marmalade & ginger sponge & custard
Roast lamb mint sauce	Cabbage, peas, carrots	Peach flan & cream
Sausages & onions	Roast potatoes	Cheese & biscuits
Savoury mince	Broccoli and sliced beans	Apple sponge & custard
Tuna pasta bake	Chips	Ice cream
Battered cod	Mustard mash	Rice pudding with jam
Poached cod in parsley sauce	Roast parsnip	Jelly
Liver & bacon	Cauliflower cheese	Mandarin cheese cake & cream
Roast turkey, stuffing & cranberry sauce	Baked beans	Yogurt
Cod with lemon	Mashed potatoes	Jam roly poly & custard
Scampi	Sweet corn	Chocolate mouse
Cod in cheese sauce		Jam sponge & custard
Beef stew & dumplings		Cheese cake & cream
Smoked haddock		Banana & custard
Minced beef and onion pie		Sherry trifle & cream
Roast pork, stuffing & apple sauce		Strawberry mouse
Steamed cod		Pear & almond sponge & custard
Steak and kidney pie		
Chicken curry & rice		
Sausages in the toad		
<b>Indian (mainly Gujrati) Vegetarian main dishes</b>	<b>Indian side dishes</b>	<b>Indian puddings/desserts</b>

Bhinda nu shaak (okra curry dish)	Dhokra (made out of besan which is chickpea flour and rice flour and can be eaten for breakfast, main dish or side dish)	Fresh fruit
Vaghareli Khichdi (rice, lentil and vegetable porridge)	Rotli (Indian flat bread also called Chappatis or roti)	Kheer (rice pudding)
Pudla (Indian chickpeas crepes)	Rice	Biscuits
Cabbage, carrot and Mix Pepper nu shaak	Onion Bhajiya	cake
Kadhi ( Kadhi or karhi is an Indian dish. It consists of a thick gravy based on chickpea flour, and contains vegetable fritters called pakoras, to which sour yogurt is added to give it little sour taste. It is often eaten with boiled rice or roti)	Pakora	
Sukhee Bhaji (boiled potatoes mixed with green chilies and spices)	Seasonal salad and yogurt	
Vaal nu shaak (dish of butter beans)	Spring roll	
Daal dhokri ( lentil dish)	Raita (yogurt with raw or cooked vegetables)	
Sprouted mug (bean dish)	Thikki Bhakri	
Puran puri (sweet flatbread)	Mathiya (thin crispy made out of different flours and spices)	
<b>Japanese main dishes</b>	<b>Japanese side dishes</b>	<b>Japanese puddings /desserts</b>
Baked fish	Tofu	Soft adzuki-bean jelly
Nikujaga (Boiled meat and vegetables)	Boiled spinach	Japanese cake
Boiled fish	Miso soup	Yoghurt
Oden (winter food, boiled egg, vegetables with Japanese soup)	Baked egg	
Chikuzen-ni (Boiled chicken, root vegetables)	Kinpira (fried burdock root and carrot)	
Udon (noodle)		

## Appendix 4

### ACTIVITIES

#### Light exercise

- Preform light hand and leg exercises while sitting on a chair– (Chair-aerobics)
  - 1) make a fist then extend fingers, repeat a few times;
  - 2) roll each hand around the wrist clockwise and anticlockwise,
  - 3) roll legs around the ankles clockwise and anticlockwise,
  - 4) extend hands above head
    - Play catch with a plastic beach ball- take turns throwing the light weight ball back and forth. Try catching the ball with two hands or hit the ball with an open palm (one hand or two hands)
    - Balloon volleyball

#### Flower arrangement

#### Jewelry making

#### Arts and Craft therapy

#### Henna art (mainly for the Indian group)

#### Indian vegetable preparation

#### For the Indian group

Festival of Narvatri – dancing with Dandiyas ( wooden colourful sticks)

## Appendix 5

### GAMES

#### Playing word games

- Play a game of 'I spy with my little eye'. The first person starts by saying: *I spy with my little eye something beginning with B or any other letter of the alphabet*. It can be an object starting with any letter of the alphabet. The other person needs to find the word and then they take turns, changing roles.
- Play a game of 'names'. For example think of Female or Male names starting with a different letter of the Alphabet each time (e.g., tell me a female name starting with A). Each person needs to say one name and the same name cannot be repeated.

#### Playing games with numbers

- Bingo
- Sudoku

#### Playing observation games

- Find the differences: look at two photos and find the differences
- Puzzles

#### Playing board games

- Game of ludo (Indian group)
- Game of carrom (Indian group)
- Chess
- Scrabble
- Monopoly
- Cluedo

## Appendix 6

### HOME AND FAMILY STRUCTURES

#### Rooms of the house

English and Indian	Japanese
Living room, or front room, or sitting room	Shared big dining room
Toilet	Toilet
Bathroom	Bathroom
Bedroom	Shared bedroom (Individual spaces are separated by curtains.)
Kitchen	Wash space at the corner of dining room
Dining room	

#### House objects

<u>English</u>	<u>Indian</u>	<u>Japanese</u>
Paintings of 'the great masters'	Large framed family photos on the walls	TV in dining room
Artificial flowers	Brass items (e.g. pots) and ornaments	Walking aid in dining room
Teapot on kitchen worktop and a kettle	Colourful pillows on furniture	Equipment with rope for exercise in dining room
Gas cooker	Artificial flowers	Table and chairs in dining room
Sofa/a couple of armchairs/ coffee table	Framed pictures depicting scenes of Indian life	Bed for nap in the corner of dining room
TV/radio	Cloth scrolls	Flowers in vase in dining room
Cabinet which includes china cups/glasses/ornamental plates	Religious symbols such as pictures or statues of deities Incense holder and sticks	Closet in bedroom
		Individual bed in bedroom
		Curtains separating individual space

**Family relations**

<b>English</b>	<b>Indian</b>	<b>Japanese</b>
Usually a nuclear family: Mother, Father, two children, Grandparents, Uncles, Aunts and first cousins	Usually an extended family: Mother, Father, 2-3 children, Grandparents, Uncles, Aunts and first, second, third cousins, in-laws, possibly close friends.	Usually a nuclear family: Mother, Father, one or more children, Grandparents
<p><b>Roles/Responsibilities:</b> Children assume personal responsibilities from a young age and it is considered desirable to leave home when they reach the age of 18. If the parents need care the children are responsible to organize home care or find a nursing home.</p>	<p><b>Roles / Responsibilities:</b> The caring of older parents ‘falls onto the shoulders’ of the elder son and his wife.</p>	<p><b>Roles/Responsibilities:</b> The elderly today got married when they were about 20 years old, but now the adults are late in marriage, so they stay with their families for a long time. Many people live in their parents' house until they get married. Or, some people find employment and live by themselves. Nursing care for the elderly is the responsibility of the child, but elderly people may care for the elderly in some cases.</p>
	<p>Grandparents (different way of calling paternal and maternal grandparents) <u>In Bengali:</u> Paternal grandmother is called : Thakuma Maternal grandmother: Dida Grandfather (paternal/maternal) : Dadu <u>In Gujrati:</u> Paternal Grandfather: Dada or Bapuji Paternal Grandmother: Baa Maternal Grandfather: Bapuji (some parts of Gujarat also use Nana). Maternal Grandmother: Nani or Ba</p>	<p>It is until the child is born that the couple call each other with their first name. In the family, only children are called by the first name. Family members call each other by roles rather than by name. Children call parents "dad" "mom". Husband calls his wife "mom" and his wife calls her husband "dad." After children are born to the couple, they will call their parents as "grandpa" "grandma".</p>

	<p>Uncles and Aunts (similarly different names of calling maternal and paternal relatives)</p> <p><u>In Bengali:</u></p> <p>Aunt from the father's side of the family: Pishi (In Gujrati Foi)</p> <p>Aunt from the mother's side of the family: Mashi (same in Gujrati)</p> <p>Uncle from the father's side of the family: Jethu if he is older than the father or Kaku if he is younger (in Gujrati, Kaka)</p> <p>Uncle from the mother's side of the family: Mama (same in Gujrati)</p>	
	<p>An elder sister is usually called 'didi' and an elder brother 'dada' in Bengali. An elder brother in Gujrati is 'Bhai' and sister is 'Ben'.</p>	

## Appendix 7

### MAPPING THE SCENARIOS TO GUIDELINES

In the following table we mapped the guidelines we have developed with the detailed scenarios presented in D1.1. The goal of this mapping exercise was twofold: 1) to ensure that the development of guidelines is congruent to the original conceptual diagrams (see D1.1 Diagram 1-4, pages 9-11), and 2) to identify any scenario areas that have not been included in the guidelines and to deal with them in the next stage of guideline development.

The cultural scenarios of our eight fictional characters (Mrs. And Mr. Yamada, Mrs. and Mr. Chaterjee and Mrs. and Mr. Smith, Mrs. and Mr. Khan) were developed using the theoretical principles of Papadopoulos (2006) and Hofstede (1991) to cover all the specific areas highlighted in the conceptual diagrams (1, 2, 3, & 4; see D1.1. pages 9-11) which depicted the guiding values and beliefs for health and illness (Diagram 1), maintaining quality of life (Diagram 2) , the cultural factors to be considered for health, illness and quality of life (Diagram 3), and mapping the day of an older person living in assistive care facility (Diagram 4). The main concept and the sub concepts of each of the four diagrams are represented in the first column of this table. For example, diagram 2 on ‘maintaining quality of life’ is composed by the sub concepts of ‘maintenance of independence’, ‘maintenance of physical health’, ‘retaining cognitive function’, ‘prevention of harm’, and ‘spirituality’.

The remaining five columns of the table represent the main five categories on which the development of specific guidelines was focused; A) topics of conversations, B) goals, C) qualitative behaviours, D) quantitative parameters and E) norms.

The developed guidelines were mapped against the sub concepts of each conceptual diagram used for the development of the scenarios.

For example, in the table below, the values and beliefs for health (item 1.4) are included in the goals section (B) of the guideline tables for health promotion (HP) and these are recorded on the mapping table as BHP1, BHP2, BHP3, BHP4, BHP5; they are also included in the qualitative behaviours section (C) of the guidelines table for enactment of fear (FR) and these are recorded on the mapping table as CFR1, CFR2, CFR3; they are also included in the quantitative parameters section (D) of the guidelines table for volume (V) and proxemics (P) and they are recorded on the mapping table as DV7 and CP6. The number for each code represents the unique number of the guideline in each category.

The mapping table indicates that a few areas for expansion are required mainly on the ‘topics of conversation’ category. Further specific guidelines also need to be developed, in the areas of ‘maintaining quality of life’ and ‘values/beliefs’.

**Mapping guidelines across concepts and sub-concepts of scenarios**

Concepts and sub-concepts from original diagrams	A) Topics of conversations	B) Goals	C) Qualitative Behaviours	D) Quantitative Parameters	E) Norms
<b>1. Values and Beliefs</b>					
1.1 Life	A24, A25				
1.2 Individual	A4, A5, A6, A23, A25, A26		CF1, CF2, CF3, CP3, CP4, CP5, CD1, CD2, CD3, CD4, CFR1, CFR2, CF3, CS1, CS2, CFD1, CFD2, CPA1, CPA2, CPA3, CPA4, CPA5		E16, E18
1.3 Care	A22, A23, A28, A37	BHP19	CC1, CC2, CC3		
1.4 Health	A22, A23, A28, A38	BHP1, BHP2, BHP3, BHP4, BHP5,	CFR1, CFR2, CFR3	DV7, DP6	
1.5 Illness	A22, A23, A25, A37		CF2, CS1, CS2		
1.6 Role of family in Health and Illness	A25		CF1, CD2, CC1, CC2, CC3		
<b>2. Maintaining Quality of Life</b>					
2.1 Maintenance of Independence	A22, A25, A28,	BHP1, BHP2, BHP3, BHP4, BLT2, BLT17	CFR1, CFR2, CFR3, CDI1, CDI2, CDI3		
2.2 Maintenance of physical Health	A7, A11, A15, A22, A23, A25, A28, A33, A37, A38	BM6, BM7. BHP1, BHP2, BHP3, BHP4, BHP17, BHP18, BLT1, BLT3, BLT4,	CSA1, CSA2, CCO1, CCO2, CCO3	DV6, DV7, DP6, DS3	

		BLT5, BLT9, BLT10, BLT11, BEV1, BEV2			
2.3 Retaining Cognitive function	A1, A2, A3, A8, A9, A10, A12, A17, A18, A19, A20, A21, A22, A23, A25, A26, A27, A29, A30, A31	BHP5, BHP6, BHP7, BHP8, BHP10, BHP11, BHP12, BHP13, BHP14, BHP16, BCF3, BCF5, BE1, BE2, BE3, BE4, B45	CH1, CH2, CH3, CL1, CL2, CL3, CCO5, CCO6	DV6, DP7, DP8, DSL2	
2.4 Prevention of harm	A21, A21, A22, A23, A25, A28, A38	BM5, BLT6, BLT9, BLT10, BLT11, BEV1, BEV2	CSA1, CSA2, CCO1, CCO2, CCO3	DP11	E4, E5
2.5 Spirituality	A13, A14, A20, A21, A22, A23, A24	BHP9, BHP15, BHP19, BCF1, BCF2, BCF4, BCF8, BCF9	CPA1, CPA2, CPA3, CPA4, CPA5	DV4, DV5, DV7	
<b>3. Cultural Factor</b>					
3.1 Religion	A1, A2, A3, A4, A5, A6, A7, A13, A14, A20, A21	BM5, BHP9, BHP15, BCF1, BCF2, BCF4, BCF6, BCF7, BCF8	CPR1, CPR2	DV4, DV4	E13
3.2 Code of conduct	A1, A2, A3, A4, A5, A6, A7, A36, A39, A40, A41		CG1, CG2, CG3, CG4, CG5, CG6, CR1, CR2, CR3, CA1, CA2, CT1, CT2, CT3, CT4, CP1, CP2, CP3, CP4, CP5, CH1, CH2, CH3, CD1, CD2, CD3, CD4, CAN1, CAN2, CAN3, CTO1, CTO2, CTO3, CBP1, CBP2, CBP3, CBP4, CBP5, CBP6, CBP7, CHG1, CHG2, CHG3, CHG4,	DV1, DV2, DV3, DP1, DP2, DP3, DP4, DP5, DP10, DP12, DS1, DS2, DS4, DJ1, DJ2, DJ3, DJ4, DJ5, DDP1, DDP2, DDP3, DDP4, DEC1, DEC2, DEC3	E1, E2, E3, E6, E7, E8, E9, E10, E11, E12, E14, E15, E16, E17, E19, E20, E21

			CHG5, CHN1, CHN2, CEC1, CEC2, CTC1, CTC2, CTC3, CTC4, CS1, CS2, CFD1, CFD2, CPA1, CPA2, CPA3, CPA4, CPA5, CSA1, CSA2, CPR1, CPR2, CDI1, CDI2, CDI3, CCO1, CCO2, CCO3, CCO4, CCCO5, CCO6		
3.3 Family structure	A1, A2, A3, A4, A5, A6, A7, A8, A16	BHP8, BHP16	CF1, CD2, CL1, CL2, CL3, CAN1, CPR1, CPR2		
3.4 Regions & Language	A1, A2, A3, A4, A5, A6, A7	BM1, BM2, BM3, BM5, BHP8, BHP13, BLT3, BLT4, BLT5, BCF3, BCF5	CRS1, CRS2, CRS3, CPR1, CPR2		E18
<b>4. Daily Routines</b>					
3.4 Morning	A9, A24	BM1, BM2, BM3, BM4, BM5	CS1, CS2, CCO1, CCO2, CCO3		
3.5 Mid-morning/pre lunch	A8, A19, A20, A21, A22, A25, A30, A31, A32, A33, A34	BHP2, BHP3, BHP4, BHP16, BE3	CS1, CS2, CCO1, CCO2, CCO3		
3.6 Lunch	A19, A 28, A35, A36, A37	BLT1, BLT2, BLT3, BLT4, BLT5, BLT6, BLT7, BLT8, BLT9, BLT10, BLT11, BLT12, BLT13, BLT14, BLT15, BLT16	CS1, CS2, CCO1, CCO2, CCO3, CCO4	DV8, DV9, DP9	

3.7 After lunch	A10, A11, A12, A16, A17, A18, A20, A21, A22, A23, A25, A26, A27, A29, A30, A31, A33, A34, A38	BHP1, BHP5, BHP6, BHP7, BHP8, BHP9, BHP10, BHP11, BHP12, BHP13, BHP14, BHP15, BLT17, BE4, BE5	CS1, CS2, CCO1, CCO2, CCO3	DSL1	
3.8 Dinner	A19, A28, A35, A36, A37		CS1, CS2, CCO1, CCO2, CCO3, CCO4	DV8, DV9, DP9	
3.9 Evening	A20, A21, A27	BE1, BE2, BEV1, BEV2, BEV3	CS1, CS2, CCO1, CCO2, CCO3		

### Key for codes (the numbers correspond to the guidelines tables)

A: Topics of conversation	B. Goals	C. Qualitative Behaviours	D. Quantitative Parameters	E. Norms
A1-18 + A19-41	BM: Goals, Morning BHP: Goals, Health Promotion BLT: Goals, Lunch Time BCF: Goals, Religious/Cultural Festivals BE: Goals, Entertainment BEV: Goals, Evening	CG: Qualitative, Greeting CR: Qualitative, Receiving/giving an object CA: Qualitative, Asking for confirmation CF: Qualitative, Enactment of suffering and pain CT: Qualitative, Tone of voice CP: Qualitative, Enacting privacy CH: Qualitative, Enactment of happiness CD: Qualitative, Enactment of distress CL: Qualitative, Enactment of love CC: Qualitative, Enactment of compassion CAN: Qualitative, Enactment of anger CFR: Qualitative, Enactment of fear CTO: Qualitative, Time orientation CBP: Qualitative, Body posture CHG: Qualitative, Hand gestures CHN: Qualitative, Head nodding CEC: Qualitative, Eye contact CTC: Qualitative, Touch	DV: Quantitative: Volume DP: Quantitative: Proxemics DS: Qualitative, Speed/Velocity DJ: Quantitative: frequency of jokes DSL: Quantitative, Silence DDP: Quantitative: Duration of pauses DEC: Quantitative: Eye contact	E1 - 21

		CS: Qualitative, Silence CFD: Qualitative, Enactment of Friendship CRS: Qualitative, Enactment of Respect CPA: Qualitative, Enactment of Patience CSA: Qualitative, Enactment of Sadness CPR: Qualitative, Enactment of Pride CDI: Qualitative, Enactment of Dignity CCO: Qualitative, Enactment of Cooperation		
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