Do the positive or negative attitudes younger adults have towards older adults affect the frequency usage of elderspeak markers? A mixed method study that analyses the use of sentence fragments, repetitions, and questions through a referential communication activity.

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Abstract: Younger adults are typically perceived to have negative attitudes towards older adults (Bratt and Fagerström, 2023) and in turn adopt elderspeak, a simplified speech register with exaggerated pitch and intonation, simplified grammar, limited vocabulary, and slow rate of delivery' (Kemper et al, 1998: 56). An understudied gap in the literature concerns that some younger adults hold positive stereotypical views and attitudes of older adults and therefore we should not hold younger adults in a homogeneous group (Cuddy, 2005). Therefore, the current study uses a mixed method approach to question if the positive or negative attitudes of younger adults towards older adults affect the frequency of usage of sentence fragments, repetitions, and questions, as elderspeak markers.

The current study initially examined 7 female younger adults (YA) attitudes towards older adults (OA) using the Refined Aging Semantic Differential Scale. Then a combination of aged-matched and mismatched dyads were used across a partially replicated referential communication activity based on the work of Kemper et al 1995. Relative frequencies, average scores and Chi-Square tests were calculated and tested for significant differences across linguistic variables.

Overall, it was found all younger adults increased their usage of all elderspeak features tested in age-mismatched dyads compared to age-matched dyads. Chi-square test results show a significant difference between attitudinal groups' usage of sentence fragments and complete sentences. Overall, the negative group used more sentence fragments compared with the positive attitude group, which can be supported through the inter-group accommodation theory (Ryan, 1986). However, when the usage of repetitions and questions were tested, and it was found that the positive attitude group used more instances of these linguistic variables. Overall, this aligns with Thomas (2010) who explained there are positive aspects of elderspeak, such as repetition, which can benefit OA comprehension.

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1. Introduction

Elderspeak has been researched over 4 decades and reveals inconsistencies relating concept coherence (Shaw and Gordon, 2021). Whilst previous research draws on evidence from within; the healthcare sector (Grimme et al 2015) (Schnabel, et al, 2020). This study takes place outside the healthcare sector, considering the following research question: do the positive or negative attitudes of YA towards OA affect the frequency usage of selected linguistic features associated with elderspeak, specifically measures of fluency, and speaker style? This study aims to gain a deeper understanding of contemporary attitudes of YA towards OA and how this affects speech accommodation, whilst comparing the current study results to Kemper et al (1995) To address the research aims and question, emerging themes have been addressed: motivation behind studying elderspeak, ageism, social attitudes and elderspeak, alongside the findings from influential studies, to inform the mixed method research design.

2. Literature review

2.1 Motivation for studying Elderspeak.

There is a statistical trend, showing a rise in the UK population of OA. According to the 2021 census, there has been an increase of nearly 2 million OA, compared to 2011 (National Office for Statistics 2021). Moreover, a recent report predicts a further rise of 10% by 2028 and 32% by 2043 (Age UK, 2023:3). With elderspeak research being heavily weighted in the healthcare sector a broader understanding is needed of how the ageist, or inclusive attitudes of YA towards OA can influence the usage of elderspeak (Kemper, Harden, 1999), beyond the language norms within healthcare.

2.2 Social Attitudes

Stereotypes are 'cognitive representations of a group' which are characteristics or traits we expect a particular group to have (Harwood, 2007: 50). Attitudes are the overall emotion to a particular person or group (Dennison, 2024). Negative attitudes and stereotypes can be problematic; stereotypes are often inaccurate and cause assumptions to be made about an individual without interaction. A negative attitude is consequential as it can cause people to dislike a particular group with no justification as to why (Harwood, 2007).

Nosek et al (2007) explains that the social attitudes of individuals largely foster a negative implicit attitude towards outgroups. While there is a range of positive and negative stereotypes of OA, causing differing attitudes (Cuddy et al, 2005), YA are generally assumed to have a negative attitude towards OA (Bousfield and Hutchinson, 2010). This has resulted in an extensive amount of research surrounding ageism and how to combat ageism within YA (Fragoso and Fonseca, 2022). To date studies are weighted heavily on the negative aspect of ageism and its impact. There is minimal research addressing the notion of how communication is impacted by positive attitudes held by YA towards OA, illustrating the need to examine this aspect (Kishita et al, 2015).

2.3 Ageism

The term ageism was initially coined by gerontologist Robert Butler (1969) as a significant social issue (Levy and Macdonald, 2016). Butler described ageism as 'prejudice by one age group toward other age groups' (Butler, 1969: 243) a form of bigotry 'that we tend to overlook' that has similar effects to those of racism and sexism (Butler, 1969: 243). In 2017 Age UK defined ageism, predominantly focussing on the negative problem of ageism and define the term as 'discrimination or unfair treatment based on a person's age' (online) however the implications of this definition are much more [favourably] than others because of their chronological age' (Lesser, 2012: 79). Which supports the viewpoint of the World Health Organisation who connect agism to discrimination, prejudice, and the stereotypes that people hold (2021).

As the OA population grows rapidly (National Office for Statistics 2021) (World Health Organisation, 2023) attitudes often show 'patronizing behaviour as well as unwarranted simplified and slow communication' (Levy and Macdonald, 2016: 7) often resulting in

negative interactions with OA and ageism being demonstrated in language-based discrimination, such as elderspeak.

2.4 The occurrence of negative attitudes

The Terror Management theory (Greenberg et al, 1986) and the Social Identity Theory (Tajfel and Turner, 1979) explains why ageism occurs within an individual (Ayalon and Tesch-Römer, 2018: 2). Both theories indicate society's attitudes when the term 'ageism' was initially coined and offer reasons why ageist attitudes are prevalent in a modern-day society. Both theories place an emphasis on social relations and self-identifications. Similarly, the 'in-group' (YA) need to increase self-esteem and their self-identity more so than the 'out-group' (OA). While the Terror Management Theory offers an explanation as to why ageism occurs the Social Identity Theory focuses more on needing to make positive distinctions between the two groups and relates this to increasing self-identity.

The Terror Management Theory (Greenberg et al, 1986) proposed humans have cognitive abilities that allow self-consciousness, thus having more awareness of their vulnerability and mortality. This theory proffers one explanation for prejudicial attitudes being linked to young and middle-aged adults' uneasiness around death (Butler, 1969). As OA serves as a reminder of mortality, a person protects their self-esteem by identifying with the 'ingroup', thus acting as a buffer for their 'death-related anxiety' (Ayalon, Tesch-Römer, 2018: 4).

The Social Identity Theory (Tajfel and Turner, 1979) suggests 'individuals do not just act based on their personal characteristics or interpersonal relationships but as members of their reference groups' (Ayalon & Tesch-Römer, 2018: 4). In essence, to have positive self-identity there must be positive distinctions between the in-group and out- group. This is evident within Billig and Tajfel's (1973) study. They explored social categorisation within intergroup behaviour and found there was random discrimination between randomly allocated groups. More recently the findings from Bergman and Bodner (2015) support the Social Identity Theory. In their sample of 149 young adults aged 19 – 29 'ageist attitudes would interfere with the [YA] ability to respond to [OA] with compassion'. Echoed in research by Swift and Steeden depicting if younger people perceive OA to be a part of the 'outgroup' this could encourage negative attitudes towards the OA (2020). Despite these findings, Tajfel and Turner (1979) claimed the opposite regarding the Social Identity Theory and suggested that

in-groups often internalise negative self-perceptions and conversely portray positive attitudes towards the out-group.

Negative attitudes towards OA and aging are still prevalent in the UK (Bratt and Fagerström, 2023). Ageist views can cause OA to be discriminated against in everyday life leading to legislative changes, promoting a more inclusive approach to attitudes and aging. Kishita et al, (2015) suggests that policies are one-way of improving attitudes by changing OA perceptions within society. Kishita et al, (2015) recommend research outside of the healthcare setting as this will have a greater effect on social inclusion within everyday life. However, the literature suggests that negative attitudes are still prevalent despite legislative changes in the UK.

2.5 Elderspeak

The term 'elderspeak' was first coined by Cohen and Faulkner in 1986 (cited in Shaw and Gordan, 2021). (Whitbourne, 2008). The initial concept suggested elderspeak was similar to *babytalk*, also known as infant, directed speech and is characterised by 'prosodic exaggeration and lexical and syntactic simplification' (Genovese et al, 2020: 22). Due to the similarities of elderspeak and infant directed speech, the latter is directed inappropriately towards OA. (Whitmer and Whitbourne, 1997). More recently elderspeak is 'assumed to be a speech accommodation to the perceived communication needs of OA' (Kemper and Harden, 1999: 656). More specifically that OA need simplified speech (Shaw and Gordon, 2021). Kemper et al suggests elderspeak is a 'simplified speech register with exaggerated pitch and intonation, simplified grammar, limited vocabulary and slow rate of delivery' (1998: 56). YA often accommodate their communication and use elderspeak features when they have identified OA age cues such as cognitive and functional impairment (Draper 2005), however this is not the only reason as to why elderspeak occurs, according to the behavioural theory, the Communication Predicament of Aging Model (Ryan et al, 1995). This proposed that adults accommodate their speech to enhance communication to achieve a satisfactory interaction with an OA. This is due to stereotyped expectations which in turn cause a change in the speech directed towards an OA (Coupland et al, 1988). Elderspeak is more commonly seen in healthcare settings and Ryan, et al suggests this due to stereotypical assumptions OA are less competent than YA, who subsequently will clarify their speech through simplification (1995).

Abramson and Silverstein (2006) found YA, in comparison to older and middle-aged adults perceived OA as lonely and miserable with a defective memory. If YA have negative stereotypes, it is likely they will try to accommodate their speech due to the stereotypical perceived ideas they have regarding OA even if this is not the case of the OA they are speaking to. There remains a question around what triggers elderspeak, as Kemper et al, (1995) suggested it resulted when OA seemed confused or needing clarification. However, they subsequently proposed (1996) that it was spontaneously adopted.

The Communication Accommodation Theory (Ryan et al, 1986) and the Communication Predicament of Aging Model (CPAM) (Ryan et al, 1986) exemplify that typical negative stereotypical OA beliefs can 'contribute to a negative feedback cycle in communication with OA' (Hummert, 2017: 570). The Communication Accommodation Theory (CAT) is a classic behavioural theory which can suggest why people alter their speech based on their communication partner's needs. The problem encountered is that typically 'accommodation is a result of intergroup process' whereby speakers modify speech based on affiliations with assorted social categories (Palomares et al, 2016: 123) not on the communication needs of the individual. In relation to elderspeak and intergenerational communication the YA typically over accommodates due to assumed communication needs of the OA. (Shaw and Gordon, 2021). The CPAM was developed from this and highlights how when YA stereotype OA as dependent and incompetent based on old age ques, such as white hair, it causes YA to adopt exaggerated speech patterns. Such theories clarify that stereotypes of OA are overwhelmingly negative which focus on psychological, physical, and cognitive characteristics of OA which then play a role in intergenerational communication because of the communication implications they cause (Hummert, 2011) As Ryan et al (1986: 6) discusses communication with OA is a two-way process, and this is part of an intergroup encounter. He links the CPAM to intergroup over-accommodation (Ryan et al, 1986: 9) and highlights how YA view OA as one homogenous group. Therefore, these speech modifications are based on stereotypes off the stereotype which do not always directly relate to the needs of the OA. However, as Ryan et al (1986) highlights, echoed by (Reid and Ng, 1999) intergroup over accommodation can reflect linguistic stereotyping however it's important to be aware that this over-accommodation is unconscious.

2.6 Elderspeak characteristics

The characteristics of elderspeak fall into two domains: verbal and nonverbal (Shaw and Gordon, 2021). Regarding this, the study will focus on verbal attributes, specifically verbal fluency and speaker style as previously identified and analysed by Kemper et al (1995).

2.6.1   Verbal fluency

Kemper (1994) and Kemper et al (1995 & 1998) studies all have consistent findings regarding verbal fluency. One measure relevant for this study is the mean length of utterance (MLU), which is used as a 'general measure of fluency' (Kemper et al, 1995: 44). Shaw and Gordon, 2021 cite Samuelsson et al, 2013 who states utterances to OA are often less complex and / or shorter than utterances to YA. An utterance is a unit of spoken language and can be identified either by a break in speech (APA dictionary of psychology, 2018). However, Kemper et al, defines this slightly differently, utterances were suggested to be defined by notable pauses within the speaker's speech flow and they did 'not necessarily correspond to grammatically defined sentences but included non-lexical interjections, fillers [e.g., you know, yeah, well] and sentence fragments' (2010: 956). This is the definition used in the current study to formulate the MLU.

Verbal fluency can also be measured through the incidences of complete sentences vs sentence fragments. According to Kemper et al, '[complete] sentences were required to have a main verb and usually expressed as an imperative [while] a fragment typically lacked a verb' (1998: 46). Furthermore, sentence fragments have also been linked to mental status by Kemper (1994) suggesting there is a link between presumed communicative competence of the interlocular.

Kemper et al (1998) study 'using elderspeak with OA' results found that for the YA speech fluency as a multivariant was significant. Overall, YA used more 'words, utterances, and fragments when they were instructing role-playing OA' (Kemper et al, 1998: 65). While the findings are relevant in age, they differ on the basis the YA perceiving the OA to have dementia. The OA used in the current study was deemed to be 'aging normally' and did not have dementia, therefore they will not present the same age cues which could trigger the use of elderspeak. Earlier literature by Kemper et al (1995) based on verbal fluency is more informative for the present study as the OA used were aging normally 60 – 84 years. Kemper

et al, suggested that YA 'produced more total words and utterances whilst addressing OA' (1995:50). While the findings are the same as Kemper et al (1998) the findings are more robust for the current study as the inclusion criteria for the OA was much more similar. Examination of sentence fragments have also been analysed in Kemper (1994), overall, it was found speech to OA contained more sentence fragments opposed to speech towards a YA. These previous findings have influenced the verbal fluency hypothesis formatted in section 2.7.

2.6.2 Speaker style

Tag questions have been classified as an elderspeak marker, as seen in Kemper (1994) who analysed the use of tag questions from service providers and caregivers. As discussed by Basque et al (2020: 899) tag questions are 'imperative, declarative, exclamative or interrogative statements that have been modified to include a question [for example] *it's hot out, isn't it?'* Despite this, Basque et al (2020: 900) also suggests tag questions function to 'gather information or facilitate a desired reaction' and are not solely elderspeak. Contrasting findings surrounding the usage of tag questions have been found by Kemper (1994) and Kemper et al (1995). Kemper (1994: 17) highlighting 'tag questions did not vary with audience', whilst Kemper et al (1995: 51 finds '[YA] did use more tag questions when addressing older listeners.

Furthermore, Kemper et al (1998) identifies location checks as an elderspeak marker, which can be either a statement or a question, whereby the speaker asks a question to the listener to clarify the location point or explicitly states the location for example 'we are now at the corner [and] are you at the post office now?' (Kemper et al, 1998: 64). Literature surrounding question discourse has further influenced the coding of questions in this data set. Athanasiadou (1991:109) observed that 'different types of questions are characterized by different functions'. They discuss *information questions* being motivated by the speaker wanting to know information and assuming the listener knows the answer (Athanasiadou, 1991:109). For this study, tag, information, and confirmation questions, including question location checks, have been analysed due to the limited data on question usage in elderspeak. Kemper et al (1998) identified that YA provided more location checks when instructing OA who were simulating having dementia. However, their study combined location check

statements and questions within their results whereas the current study focuses solely on location checking questions in an OA without dementia.

Kemper 2001 states that paraphrasing and repetition can improve OA comprehension which in turn is a positive aspect of elderspeak (Thomas, 2010). Pajo: 2013 cited in Helfer et al, describes repetitions as a conversational repair strategy (2018: 695). Helfer et al (2018) goes on to suggests that by immediately repeating an utterance the listener is given more time to process the information which could be helpful for individuals with low processing speeds, therefore resulting in a positive effect. A full repetition is an instruction which has been repeated and includes the imperative verb repeated within a 'five utterance window' (Kemper 1994: 20). A full repetition is an instruction which has been repeated and includes the imperative verb repeated within a 'five utterance windows' (Kemper 1994: 20). While a partial repetition omits the verb and is just an expansion of the instruction (Kemper et al, 1998: 65). Kemper et al (1995) tested repetition for a measure of redundancy and found that younger speakers used more instructions per map and repeated these instructions more to the older listeners opposed to the younger listeners. Later findings from Kemper et al (1998) suggest YA vary their information content when speaking with OA, for example increasing the number of repetitions. However, they do not vary in the way they deliver the information to the OA, this would be regarding fluency. The findings of Kemper et al (1998) have motivated the hypothesise stated in section 2.7.

2.7 Research Questions and Hypotheses:

The review of the characteristics of elderspeak and previous findings highlight that there is limited research which connects elderspeak with how individual attitudes towards OA affects its usage. After reviewing the literature in section 2, the following research questions and hypothesis have been formulated.

2.7.1   Research questions

1. Do the positive or negative attitudes of YA towards OA affect the frequency usage of selected linguistic features associated with elderspeak, specifically measures of fluency, speaker style and questioning?

2.7.2   Hypotheses

1. All YA will use shortened utterances and more instances of repetitions, sentence fragments and questions when communicating with OA compared to when they communicate with YA.

Null hypothesis: There will be no difference in the number of repetitions, sentence fragments and questions when YA are communicating with OA opposed to YA.

2. YA with a negative attitude towards OA will use a higher number of repetitions when communicating with the OA compared to the YA with a positive attitude towards OA.

Null hypothesis: There will be no difference in the number of repetitions used when YA with a negative attitude complete the referential mapping activity with OA and YA compared to the YA with a positive attitude.

3. YA with a negative attitude will use a higher number of questions when completing the referential mapping activity with the OA compared to the YA with a positive attitude.

Null hypothesis: There will be no difference in the number of questions used when YA with a negative attitude complete the referential mapping activity with OA and YA compared to the YA with a positive attitude.

4. YA with a negative attitude towards OA will increase the amount of sentence fragments used when speaking to OA compared YA with a positive attitude.

Null hypothesis: There will be no difference in the amount of sentence fragments used by the YA with a negative attitude and YA with a positive attitude when speaking to older and YA.

3. Methodology

3.1 Design

This study will partially replicate Kemper et al (1995) speech adjustments to aging during a referential communication research task continuing to investigate the effectiveness of elderspeak. As this is one of the few studies which systematically investigates elderspeak outside of a healthcare setting, it can be expected that the findings of the study will be most comparable, as opposed to a context where elderspeak was being researched within a healthcare setting.

This mixed method approach takes advantage of both quantitative and qualitative methods. By using qualitative methods, it was possible constantly interplay between data collection and analysis, accumulating a richer understanding of how YA used elderspeak features. Quantitative approaches were used regarding the collection of data within the questionnaire and calculations of the overall distributions of each elderspeak characteristic. Descriptive statistics have been used as a method of quantifying the characteristics of the data elicited within transcripts, surrounding the use of repetitions, sentence fragments and questions. Ultimately, a largely qualitative approach has enabled the exploration of speech on an individual level to consider differences and allow for greater understanding as to why certain trends may occur.

3.2 Participants

The sample consisted initially of 8 YA participants, identified via opportunity sampling due to constraints of undergraduate research, such as lack of time and funding. Stratified by speaker sex (female) and age (18-25), females were chosen over males due to the optimal availability and speaker gender has been researched to influence elderspeak, however these findings have been inconsistent (Shaw and Gordon, 2021). A common finding suggests both male and females are likely to use elderspeak regardless of their gender to an OA (Thimm et al, 1998). Participant E was removed from the study following the referential mapping activity due to the length of the conversation being too short (5 mins) in comparison to all other recordings of 20 plus minutes which would skew comparable data analysis.

The OA participant was also obtained by opportunity sampling and participated in all online age-matched Zoom sessions. The gender of the OA was chosen to be female as 62% of the original work by Kemper et al (1995) had used participants of this gender. Age was also

replicated between 60 and 84 years. The mean age of the OA in the study by Kemper et al (1995) was 72 which was the OA age at the time of completing the present study.

All personal names have been removed from the study to meet ethical guidelines. All YA have been replaced with the term participant A, B, C, D, E, F, G and H. Data was also stored in a password protected laptop, to meet the ethical guidelines in place at Newcastle University.

3.3 Procedure

3.3.1 Questionnaire

All YA participants completed a short initial questionnaire (Appendix 1) via an emailed Microsoft form. Ethical guidelines were met by all participants through the reading of the research brief, outlining the purpose of the study and their rights as a participant, before obtaining consent. All participants provided informed consent prior to the study taking place via the completion of section1 within the questionnaire. A pilot questionnaire was sent out to one individual; feedback included the removal and replacement of English subject specific language to ensure the YA completing the questionnaire were able to easily access the questions to formulate a response. Therefore, within the filler question '*please write 3 adjectives to describe a YA'* the lexis *adjective* was changed to *words*. The questionnaire contained 7 sections. However, only 2 sections were relevant to elicit quantitative data regarding attitudes and expectations to aging. Demographic information of the participant such as their first name and age were obtained for the purpose of cross referencing to the later online map referential activity. Section 3 and 5 were filler sections to disguise the main aim of the questionnaire. Section 3 elicited information regarding the participants individual experiences with ageism and stereotypes and section 5 extracted the perception of YA.

The dependant variable measured was the attitudes towards OA as well as expectations towards aging which was measured in section 4 and 6. Section 4 was a partial replication of the Refined Aging Semantic Differential (Polizzi, 2003), to yield the attitudes YA had towards OA. To ensure the questionnaire was time efficient and did not discourage completion from the participant due to fatigue, 12 bipolar adjectives from the refined 24 were randomly selected. Participants were required to use a semantic differential scale to best represents their attitudes and opinions of OA. To reduce order effects, questions were randomised using the *shuffle tool* on Microsoft forms. The refined version of Aging

Semantic Differential was used opposed to the initial Aging Semantic Differential (Rosencrantz and McNevin, 1969) as according to Polizzi (2003: 215) it was an outdated assessment of current attitudes towards the OA.

Section 6 replicated in full the 12 item Expectations Regarding Aging (ERA) survey (Sarkisian, et al 2005). Participants used a Likert scale to identify their viewpoint about statements concerning OA. The scale ranged from, definitely true, somewhat true, somewhat false to definitely false. According to Sarkisian *et al* (2005) the ERA-12 'demonstrated acceptable reliability and validity to estimate expectations regarding aging' (240). Each participant received a score regarding expectations to physical health, mental health, cognitive function, and an overall total. Furthermore, as stated by Sarkisian et al (2005, 245) the ERA-12 is a good method to measure aging expectations if the ERA -38 is too long. This was considered to avoid extending the completion time by adding in further questions based on the same subject matter and the ERA - 12 would provide acceptable validity for this research (Sarkisian et al, 2005).

3.3.2   Referential mapping activity

Two weeks following the completion of the questionnaire all participants completed 2 online referential communication activities to measure and compare the frequency of fluency and speaker style features of elderspeak. Session 1 was conducted in an age-mismatched dyad to mirror the earlier work of (Kemper et al, 1995). Sessions were recorded via Zoom using the camera function to allow the YA to make their own judgements about the OA and adapt their communication accordingly (Trust and Goodman, 2023). The audio recordings were later used to extract data and enabled for reliable transcriptions to be created and repeated analysis to be conducted to ensure reliable findings (Herman and Williams, 2009).

Prior to the Zoom activities each YA was provided with a hypothetical town mapping document (Appendix 2). Each participant map had a different pre drawn route containing a start, mid and end point. This task was highly structured and allowed for control of the verbal responses, although the maps were not the same as those in the work by Kemper et al (1995) they were comparable with regards to the number of turns to equate for complexity (Kemper et al, 1995: 43). The OA was provided with the map outline containing no drawn route. Similarly, to Kemper et al (1995) age-mismatched dyad the YA was tasked with describing

the route to the OA, ensuring they followed the map exactly taking no short cuts. Verbalising the direction of travel and any appropriate landmarks along the way so the OA was able to follow along drawing the route on their map. In the second session, the YA were randomly matched together in an age-matched dyad. They were given the same instructions as in the age-mismatched dyad and took it in turns as speakers and listeners for a naturalistic speech sample to be obtained. Maps were described and drawn, and recordings captured for analysis and later investigation.

3.4 Variables

To test the frequency of the dependant variables (repetitions, questions, fragments, and complete sentences), YA expectations and attitudes (independent variable) were gathered though the questionnaire responses which were collated into a excel spreadsheet. The ERA – 12 scoring system (Sarkisian, et al 2005) was then used to calculate data based on positive or negative expectations regarding aging, s (Appendix 3). The calculation used which aligned with the 4 – point Likert scale (table 1) was:

$$E = ((x - 12) \times 25) \div 9$$

Table (1) *Likert Point Scale*

Likert scale			
Definitely True	**Somewhat True**	**Somewhat False**	**Definitely False**
1	2	3	4

Participant attitudes were measured using a 7 – point semantic differential scale (Polizzi, 2003) (appendix 4). Total scores were calculated then divided by the number of questions (12) resulting in an average score for each participant. If the participant had an average score between $1 \leq score \leq 3.5$ they were placed in a positive group. If the participant had an average score $3.6 \leq score \leq 7$ they were placed in a negative group.

3.5 Transcription analysis

This study used 14 recorded and transcribed conversational language samples (appendix 5A, B, C, D) covering both age-matched and mismatched dyads. Recordings typically lasted 20-30 minutes, to make this data comparable and manageable to analyse, samples were extracted from 2 minutes prior to when the midpoint on the map was verbally identified within the

discussion, until either the end of the conversation or when a further 10 minutes had elapsed. This allowed for all participants to have become at ease with both each other and the video recording element of the activity (Herman and Williams, 2009: 219). One limitation of the automated created transcripts was that in some instances inaccuracies were identified (Zoom, 2023: online). In these cases, transcripts were checked and edited by looking at the transcriptions whilst listening back to the audio to ensure both matched regarding accuracy of language used to ensure reliability.

3.6 Coding

The MLU was obtained as a general measurement totalling the sum of lexis per utterance as defined by Kemper (2010) in section 2.6.1. This total was then divided by the total number of utterances per transcript, to give MLU results for each participant, within each dyad. Complete sentences vs sentence fragments were also calculated as a measurement of fluency, by breaking down each of the YA utterances into complete sentences and sentence fragments, as per the definitions in section 2.6.1. To measure speaker style, the number of full and partial repetitions within a 5-utterance window were tallied, similarly to Kemper, 1994 (see table 2) the definition of both can be seen in section 2.6.2.

Table (2) *Partial and full repetition examples:*

Full / Partial	Participant
Full Repetition	**Participant H:** *'and then go straight up to the 2 tree[s]…go straight up to the 2 trees'*
Partial Repetition	**Participant A***: 'so up towards the white and green building with like a grass verge around it…the white and green building'*

Full repetition instances repeat the verb of the instruction while the partial repetition does not. As exemplified, this repetition repeats the adjectives describing the building.

3.7 Relative frequency calculations

For each linguistic variable, the raw number and percentage of instances were elicited to allow for a comparison to be made between participants across both dyads and attitude

groups. The percentage results demonstrated increased use of linguistic features. The relative frequency for each linguistic variable (sentence fragments, repetitions, questions) was calculated though the following equation:

$$\frac{\#occurences}{\#occurances + \#non\ occurances}$$

Occurrences were measured based on the number of times they appeared in each transcript and non-occurrences calculated from where the linguistic variable could appear but does not. The following tables illustrate the number of occurrences and non-occurrences for each linguistic variable:

3.7.2 Sentence Fragments:

No of occurrences sentence fragments were used and the non-occurrences is equal to the number of complete sentences.

Table (3) *Number of occurrences of sentence fragments within the age-matched dyad.*

Attitudinal group	Participant	Occurrence of sentence fragments	Non occurrences
Positive	A	13	52
	B	24	67
	C	15	69
	D	20	92
Negative	F	25	69
	G	15	64
	H	22	63

Table (4) *Number of occurrences of sentence fragments within the age-mismatched dyad.*

Attitudinal group	Participant	Occurrences of fragment	Non occurrences of fragments
Positive	A	25	63
	B	37	58
	C	49	82
	D	34	71
Negative	F	42	62
	G	44	61
	H	37	33

A sum of the number or occurrences and non-occurrences from table (3 and 4) was calculated to determine the relative frequency of attitudinal groups, seen in table (5).

Table (5): *Number of occurrences to determine the relative frequency of sentence fragments within the age-matched and mismatched dyad.*

Attitudinal Group	Matched		Mismatched	
	Occurrence of Fragment	Non-occurrence of fragment	Occurrence of Fragment	Non- occurrence of fragment
Positive	72	280	145	274
Negative	62	196	123	156

3.7.3 Repetitions

The number of non-occurrences of repetitions was equivalent to the number of utterances with no repetition as the speaker could have inputted a repetitional instance here.

Table (6): *Occurrence of repetitions in both age dyads.*

Participant	Mismatched		Matched	
	Occurrence	Non-occurrence	Occurrence	Non-occurrence
A	7	71	4	52
B	5	58	3	67
C	7	82	3	69
D	11	71	4	92

F	2	62	1	69
H	4	32	2	63
G	6	61	2	64
TOTAL	42	437	19	476

3.7.4 Questions

The number of occurrences for each question function was elicited and the number of non-occurrences is the number of questions which had a different function but could be a confirmation, information, or tag question.

Table 7: *Occurrence of question function in age dyads.*

Question function	Attitudinal group			
	Positive		Negative	
	Occurrences	Non-occurrences	Occurrences	Non-Occurrences
Confirmation	30	25	17	6
Information	16	39	1	22
Tag	9	46	5	18

From the tables (3 -7) above the relative frequency was calculated. This allowed to test for which variant of each linguistic variable was more or less frequent.

4. Results

4.1 Attitudinal groups

Based on the scoring system of the Refined Aging Semantic Differential scale, discussed in section 3. The attitudinal groups are set out below.

Table 8 : *Participants average attitude score.*

Participant	Average attitude score	Positive or Negative group
A	3.3	Positive
B	3.0	Positive
C	2.1	Positive

D	3.5	Positive
F	4.8	Negative
G	4.5	Negative
H	4.8	Negative

Participant A, B, C, and D all had scores ranging from 2.1 to 3.5, which indicated they had a positive attitude towards OA. Participant F, G, and H all had scores ranging between 4.5 to 4.8 which indicated their negative attitude towards OA. Due to the odd total number of participants this was the most even split to occur.

4.2 Expectations Results

As explained in section 3.4, the participants expectations to aging were calculated through using the ERA-12 calculations (Sarkisian, 2005).

Table (9) *Participants total ERA-12 score.*

Participant	Total ERA-12 score	Positive or negative expectation
A	58.33	P
B	55.5	P
C	27.7	N
D	27.7	N
F	47.2	N
G	44.44	N
H	55.5	P

Comparing table (8) and (9) shows that participant expectations and attitudes differed. Participant A and B had favourable expectations and attitudes towards OA, however participant H had a negative attitude towards OA but positive expectations about aging. Consequently, participants were segregated solely by attitudinal score to better answer the research question. Expectation questionnaire answers, seen in (appendix 6).

4.3 Verbal fluency

4.3.1 MLU

Discussed in section 3.6, the MLU was calculated by dividing the sum of words in each utterance by the total amount of utterances in the sample. As defined by Kemper et al, (2010) in section 2.6.1, utterances were defined by notable pauses in the speakers flow of speech. The MLU results, seen in table (10) show that YA use shortened utterances with OA compared to the MLU length with the YA. This is true for all participants except for participant F who does not alter or modify their MLU based on their communication partner.

Table (10) *MLU per participant in each age dyad.*

Attitude group	Participant	Age-mismatched	Age-matched
Positive	A	19	25
	B	17	25
	C	21	31
	D	22	29
Mean score		*19.75*	*27.5*
Negative	F	19	19
	G	13	24
	H	10	13
Mean Score		*14*	*18.66*

The MLU ranges from 13 to 26 in age-matched dyads and 10 to 21 in age-mismatched ones. This suggests that as the MLU range is higher in the age-matched dyad, YA speak more fluently whilst communicating with YA compared to OA. Table (10) and figure (1) demonstrate that all negative group participants in the age-mismatched dyad had a shorter MLU than positive group participants, except for participant F, who had a MLU of 19 in the age-mismatched dyad similar to participant A. The mean MLU score for each attitudinal group can be used to compare general fluency. The positive attitude group had a longer average MLU score than negative attitude group, indicating they communicate with the OA more fluently. However, both attitude groups had a longer NLU in the age-mismatched opposed to the age-matched dyad.

Figure 1: *A comparison of the participant's MLU for the age-matched and mismatched dyad.*
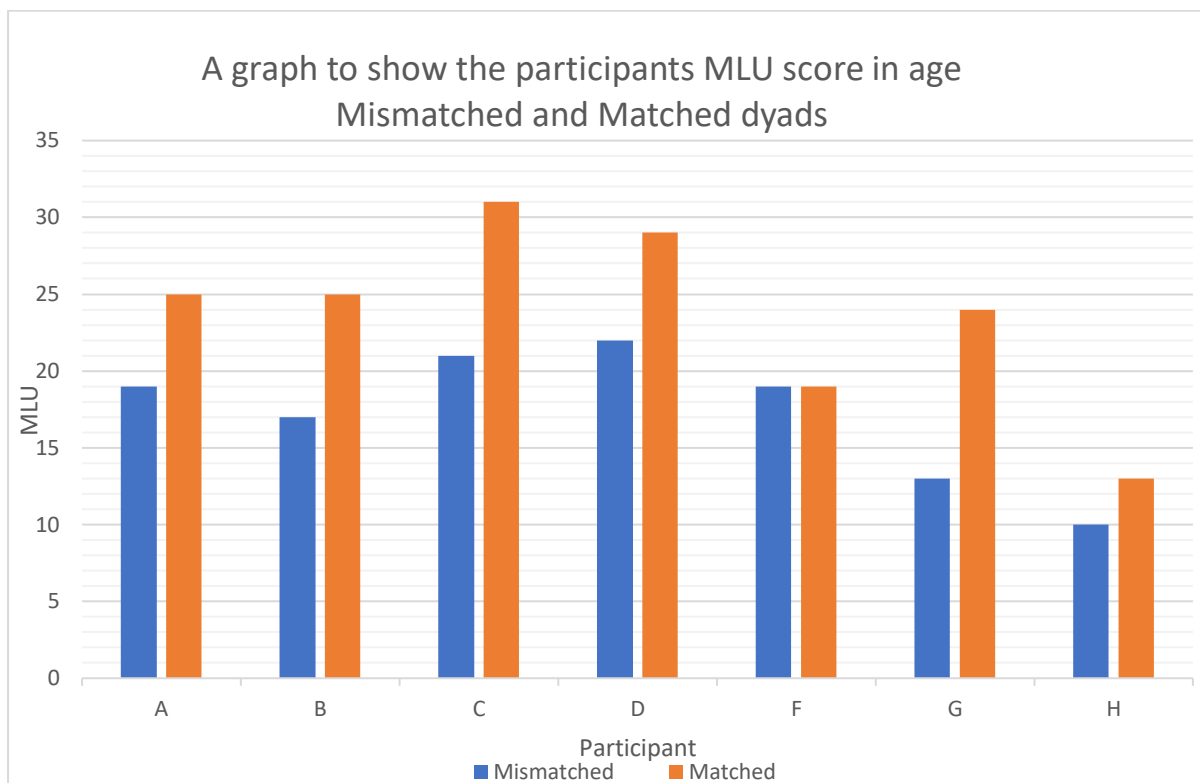
Participant G had the largest difference in MLU length, which is 9, as shown in the figure (1). This means, they spoke with the YA on average using just over 9 more words each utterance than they did with the OA. The minimal pair example below (1 and 2) illustrates this.

(1) YA Interaction

A. **Participant G:** So go in between the second and the third plant pot, then just go to that last green building green, the last green building with the yellow roof and that's the end point.

 YA: Oh amazing, I am there, that was good.

(2) OA Interaction

A. ***Participant G:*** And then at the 3 plant pots, if you just go in between the second and the third plant.

 OA: Erm yeah, let me see.

 Participant G*:* And then there's a row of three buildings, if you just go to the third building, and we are at the endpoint.

OA: Erm

Example (1A) indicates participant G speaks with YA using a single, lengthier utterance which includes two complete instructions, a fragment and ending with a complete sentence. This contrasts with the OA interaction (2A) whereby one single utterance is broken down into 3 shorter utterances, this suggests the YA participant is almost breaking the instruction down into smaller steps.

4.3.1   Sentence Fragments

As predicted, complete sentences were more common than sentence fragments when YA communicated with both OA and YA, according to the data presented in tables (11) and (12). Nevertheless, there were a higher number of sentence fragment in the age-mismatched dyad than in the age-matched dyad.

Table (11): *Raw number of complete and sentence fragments used positive attitude YA.*

Participant	Mismatched		Matched	
	Fragment	**Complete**	**Fragment**	**Complete**
A	25 (28%)	63 (72%)	13 (20%)	52 (80%)
B	37 (39%)	58 (61%)	24 (26%)	67 (74%)
C	49 (37%)	82 (63%)	15 (18%)	69 (82%)
D	34 (32%)	71 (68%)	20 (18%)	92 (82%)
Total	*145 (35%)*	*274 (65%)*	*72 (20%)*	*280 (80%)*

There were 145 sentence fragment occurrences within the positive age-mismatched dyad. When the YA communicated with the OA opposed to YA, there was an overall increase of 73 sentence fragments. This represents a 15% percentage increase, and statistical significance was then examined.

Table (12) *Raw number of complete and sentence fragments used in by negative attitude YA.*

Participant	Mismatched		Matched	
	Fragment	**Complete**	**Fragment**	**Complete**
F	42 (40%)	62 (60%)	25 (27%)	69 (73%)
G	44 (42%)	61(58%)	15 (19%)	64 (81%)
H	37(54%)	32 (46%)	22 (26%)	63 (74%)
Total	*123 (44%)*	*155 (56%)*	*62 (24%)*	*196 (76%)*

Overall, all YA used more sentence fragments when communicating with OA opposed to YA, totalling 123 sentence fragment instances in the negative age-mismatched dyad. The difference between the usage of sentence fragments in the dyads is 62 instances, this is a percentage increase of 20%.

A Chi square test was used to determine statistical significance between attitude group and age dyads, using an online social sciences calculator (Social Science Statistics, 2024) Tables (13 and 14) show the data used to calculate statistical significance. Firstly, the difference between positive and negative attitudinal groups was calculated and then statistical significance between dyads was calculated. In all Chi square tables, the observed cell totals were listed first, followed by (the expected cell totals) and [the chi-square statistic for each cell]. The online calculator inputted numbers in () and [].

Table (13) *Inputted data to test significance between attitudinal groups.*

	Mismatched Fragment	**Mismatched Complete**	**Matched Fragment**	**Matched Complete**	*Row Totals*
Positive	145 (158.09) [1.08]	274 (253.07) [1.73]	72 (79.05) [0.63]	280 (280.79) [0.00]	771
Negative	123 (109.91) [1.56]	155 (175.93) [2.49]	62 (54.95) [0.90]	196 (195.21) [0.00]	536

					1307
Column Totals	268	429	134	476	**(Grand Total)**

From the data inputted the Chi-square statistic is 8.4035 and the p-value is .038368. Therefore, the result is significant at $p < .05$. This shows that there is a significant difference between the behaviour of the positive and negative attitude group.

Table (14) *Inputted data to test significance between age dyads.*

	Positive Fragment	**Positive Complete**	**Negative Fragment**	**Negative Complete**	*Row Totals*
Mismatched	145 (115.72) [7.41]	274 (295.44) [1.56]	123 (98.66) [6.01]	155 (187.18) [5.53]	697
Matched	72 (101.28) [8.46]	280 (258.56) [1.78]	62 (86.34) [6.86]	196 (163.82) [6.32]	610
Column Totals	217	554	185	351	**1307 (Grand Total)**

The Chi-square test (table 14) revealed the Chi-square statistic is 43.9288 and the p-value is < 0.00001. The result is significant at $p < .05$. This also shows that there is a significant difference between the age-mismatched and age-matched dyad. Overall, YA used a more sentence fragments within the age-mismatched dyad opposed to the age-matched dyad.

Overall, both the positive and negative attitude group increased their usage of sentence fragments with OA. Based on the average per participant, more instances of sentence fragments occurred in the positive attitude group and there was a significant difference between the positive and negative attitude groups' use of complete sentences and sentence fragments. However, the percentage increase was larger in the negative attitude group.

Through transcription analysis, participant H frequently omitted the verb out of an utterance, causing a higher token amount of sentence fragments when speaking to the OA. However, upon inspection of the minimal pair in the age-matched dyad the similar utterance included the verb, as seen in example (3). Therefore, more tokens in the age-matched script were complete sentences (74%) as seen in example (4) compared to the age-mismatched transcript.

(3) Age-mismatched dyad.

     A. between the tall green and big blue.

     B. past the zebra crossing to the midpoint again.

(4) Age-matched dyad.

     A. Then go left that that building that has green on it.

     B. go past all 3 zebra crossings upwards.

In example (3), imperative verbs have been omitted for example in (3a) the imperative verb 'go' should proceed 'between' however the example (4a) minimal pair does include the imperative verb 'go'. Similarly, in (3b) 'go' should proceed past at the start of the sentence and finally within the utterance however the imperative 'go' is used within example (4b) when the younger adult is communicating with another younger adult. This example illustrates one reason why there is a significant difference between the use of sentence fragments and complete sentences in the age dyads.

Next, table (15) shows a comparison of the overall relative frequency of the positive and negative attitude variants in matched and mismatched age dyads.

Table (15) Relative frequency.

Independent variable attitude group	Matched Age Dyad		Mismatched Age Dyad	
	Fragment	**Complete**	**Fragment**	**Complete**
Positive	20% (72)	80% (280)	35%	65%
Negative	24% (62)	76% (196)	44%	56%

Table (15) shows within the age-matched dyad both attitude groups used more complete sentences in the age-matched dyad opposed to sentence fragments. This is expected as instructing the OA adult around the map was the main aim of the referential communication activity. It is noticeable the complete sentences often were declarative statements which functioned as an instruction to guide the OA around the map rather than the YA using

imperatives. For example, it was typical to hear the YA beginning their instruction with '*you want to go…*' or '*you need to turn…*' instead of '*go here*' or '*turn right …*'. Which could be seen as a politeness feature.

Upon analysis of the function of sentence fragments it seems both groups use fragments similarly However the negative group use more (44%) of them within their speech compared to the positive attitude group (35%). One difference between dyads was it was common to see, in the mismatched more than the matched, sentence fragments preceding the main instruction which gave more time for the older adult to complete the previous instruction; and an indicator of where they were starting from again. See example (5) below.

(5)

    A. Participant D: <u>Yeah right the next bit,</u> I'm gonna try to describe it first before like say any arrows it like goes in and out the trees and then comes back out

    B. Participant A: <u>At the traffic cones,</u> you want to turn right.

Example (5B), the sentence fragment acts as a location reinforcer, as previous to this instruction the older adult was already told they were coming to the traffic cones. This prepositional phrase which functions as an adverbial phrase that modifies the verb *turn* in the main clause, provides information as to where the action should take place. Importantly, this happens in both the positive and negative ages mismatched dyads, however it seems to be more in the negative group.

Overall, YA increased their usage of sentence fragments when communicating with an older adult. The negative attitude group had a percentage increase of 20% when communicating with OA. The positive attitude group has a slightly lower percentage increase of 15%.   There was a clear difference between the groups, making this statistically significant. Frequently, in both attitudinal groups, the participants used more fragments with the function of describing an area on the map to clarify where the older adult should have been going, as seen in table (16). Often an instructional compete sentence is followed by a descriptive sentence fragment to reinforce the location point on the map. Compare this to table (17) which shows the YA in an age-matched dyad used less sentence fragments or no fragments to reinforce the location point.

Table (16) *Age-Mismatched*

YA Participant	Sentence Fragments
Participant A	**Participant A:** Yes, so you want to go up towards the white and green building with like a grass verge round it [pause] the white and green building [pause] opposite the hospital. **OA:** just…just a minute. Now, you know the green and white building just hang on a minute while I find this. Has it got anything at the side of it another building at the side of it?
Participant B	**Participant B:** So, if you carry on towards the that road, just in front of those 2 [pause] the orange or yellow buildings and then take a right. **OA:** Am I, am I going left there to those 2 orange buildings? I'm going left.

Table (17) *Age-Matched*

YA Participant	Complete sentences and sentence fragments.
Participant H	**Participant H:** And then go right to the crossing. Then go up to the middle of the junction. **YA:** Got it.
Participant C	**Participant C:** And then take a left. Make it kind of point into the building, the midpoint. So, you going into the like hospital. **YA:** Got it.
Participant B	**Participant B:** Then turn left onto where the crossing is at that road. Go left and then left again following that road like to work in between the 2 diggers. **YA:** Yeah.

The underlined utterances within table (16) are the sentence fragment. Dialogue in table (16) is a common illustration of what sentence fragments looked like within the age-mismatched condition, highlighting fragments functioning to extend the complete sentence instruction to achieve more clarity. Compare this with dialogue in table (17), where it was common to have multiple instructions, as the YA rarely expressed confusion. Typically, after an utterance the younger adult listener would reply with 'okay' or 'yes' to emphasise they understood, instead of asking a question or repeating the instruction like the older adult often did in all sessions. Overall, the reason for these fragments was because of the reaction of the interlocutors. Due to the YA showing less confusion, less fragments occurred as there wasn't a need to extend the instruction and if there was, it was usually only one fragment.

4.4 Speaker style

4.4.1   Repetitions

The age-mismatched dataset consisted of 42 instances of repetitions while the age-matched dyad consisted of 19 repetitions in total (table 18). The mean of the repetition in the mismatched dyad is 6 compared to the mean in the age-matched dyad which is 2.7. This implies that the age-mismatched dyad has a higher average number of repetitions than the age-matched dyad.

Table (18) *Raw number and relative frequency (%) of repetitions used by YA in age dyads.*

Participant	*Age-mismatched*	Age-matched
A	7 (9%)	4 (7%)
B	5 (8%)	3 (4%)
C	7 (8%)	3 (4%)
D	12 (13%)	4 (4%)
F	2 (3%)	1 (1%)
G	6 (9%)	2 (3%)
H	4 (11%)	2 (3%)

Table (18) highlights every YA had more repetitions when communicating with the OA, opposed to the YA. The relative frequency of repetitions for YA enforces that all participants use a higher percentage of repetitions when completing the referential mapping task with the

OA, opposed to the YA. While some YA only increase their use of repetitions by 2% whilst speaking to OA most increase by 6 to 8%.

The participants divided by their attitudinal results and the repetitions were coded for instances of full and partial repetitions (table 19). Due to the different number of participants I attitudinal groups the means for each group were calculated. Overall, in the positive attitude group the mean was 7.8 (1dp) while the mean average for the negative group was 4. Therefore, the positive attitude group use more instances of repetitions compared to the negative attitude group in the age-mismatched dyad.

Table (19) *Full and partial repetitions used by each YA participant in age dyads.*

		Mismatched			Matched		
		Full	**Partial**	*Total:*	**Full**	**Partial**	*Total:*
Positive Attitudes	**A**	5	2	7	2	2	4
	B	4	1	5	2	1	3
	C	6	1	7	2	1	3
	D	8	4	12	3	1	4
	Total:	23 (74%)	8 (26%)	31	9 (64%)	5 (36%)	14
Negative Attitudes	**F**	1	1	2	1	0	1
	G	4	2	6	1	1	2
	H	1	3	4	2	0	2
	Total:	6 (50%)	6 (50%)	12	4 (80%)	1 (20%	5

Table (19) highlights it was more common for the whole instruction to be repeated when the younger adult communicated with the older adult, rather a partial repetition. For further analysis, Chi square tests were calculated to examine for statistical significance between the attitudinal groups as well as the age dyad groups as seen in table (20) and (21) below.

Table (20) *Inputted date to test for a significant statistical difference between age dyads.*

	Positive Full	**Positive Partial**	**Negative Full**	**Negative Partial**	*Row Totals*
Mismatched	23 (22.19) [0.03]	8 (9.02) [0.11]	6 (6.94) [0.13]	6 (4.85) [0.27]	43
Matched	9 (9.81) [0.07]	5 (3.98) [0.26]	4 (3.06) [0.29]	1 (2.15) [0.61]	19
Column Totals	32	13	10	7	**62 (Grand Total)**

Table (21) *Inputted data to test for significant difference between attitudinal groups.*

	Age-mismatched full	**Age-mismatched partial**	**Age-matched full**	**Age-matched partial**	*Row Totals*
Positive	23 (21.05) [0.18]	8 (10.16) [0.46]	9 (9.44) [0.02]	5 (4.35) [0.10]	45
Negative	6 (7.95) [0.48]	6 (3.84) [1.22]	4 (3.56) [0.05]	1 (1.65) [0.25]	17
Column Totals	29	14	13	6	**62 (Grand Total)**

Overall, there was no significant difference between the behaviour within the age dyads of the participant attitudes. The difference between age dyads was not significant as the P value was .623126 indicating there not to be a statistically significant difference between age-matched and age-mismatched, nor difference between the attitudinal groups, as the P value was .430394.

Table (22) *Instances of full repetitions.*

Participant	Full repetition example
A	**Participant A:** You want to follow the road down past the zebra crossing. **Participant A:** So, follow down past the zebra crossing.
Participant D	**Participant D:** And then the arrow then turns right, and it goes through the two plants. **Participant D:** So, it goes through the 2 plants.

Despite the fact full repetitions, seen in table (22), were the most common in both groups under both age dyads, the biggest difference was between the use of partial repetitions in the age dyads. Both groups increased partial repetitional usage more than full when communicating with OA. In total there was a 3 partial repetition increase in the positive group and a 5 repetition increase in the negative group.

A consistent function in both attitudinal groups was the use of age-mismatched dyad partial repetitions to enforce a location check. Notably, all the partial repetitions used by the negative attitude group had this function, whereas some partial repetitions in the positive group functioned as corrections, this can be seen in table (23).

Table (23) *Mismatched partial repetition examples.*

	Participant	Partial repetition example
Noun phrase partial repetition	A	**Participant A:** Yes. So, you want to go up towards the white and green building with like a grass verge around it. **Participant A:** The white and green building.
	F	**Participant F**: And if you pass those 2 sets of traffic cones. **Participant F:** 2 sets of traffic cones.
	G	**Participant G:** Yeah, at the bottom left-hand corner yeah. **Participant G:** The bottom left-hand corner of the building site.
Adjectival phrase as a partial repetition	F	**Participant F**: And if you pass those 2 sets of traffic cones. **Participant F:** 2 sets of traffic cones.

Table (23) highlights instance where the YA has used noun phrases as partial repetitions to reinforce the location the older adult should be moving towards. This is where the head noun has been modified by adjectives. Similarly uses a sentence fragment containing an adjectival phrase and modifier as a partial repletion to the initial instruction, *traffic cone example*. The partial repetitions exemplified are sentence fragments, therefore the YA does not repeat the full instruction as they omit the verb out of the repetition. It is evident that noun and adjectival phrases with modifiers, function as a location check for the OA. This enforces clarity for the OA and should benefit the older adult's understanding. Example (6) illustrates a partial repetition functioning as a correction using an adjectival phrase and modifier. This is both beneficial for the OA and YA to make sure they are both on the same page.

(6)

A. Participant B: If you go left [pause] sort of left slightly left.

Overall, both partial repetitions can be seen as beneficial for the older adult, the YA could be improving trying to improve the older adult's comprehension.

4.4.2 Questions

As discussed in section (3) instances of confirmation, information seeking, and tag questions were calculated as well as the total number of questions across age dyads and attitudinal groups.

Table (24) *Raw number of questions used by YA in the age-matched dyad.*

Participant	Confirmation	Information seeking	Tag Question	Total
A	0	0	1	1
B	5	2	1	8
C	5	0	4	9
D	5	0	1	6
F	2	2	0	4
G	9	0	0	9
H	4	0	1	5
Total	*30*	*4*	*8*	*42*

In the age-matched dyad there was 42 instances of questions in the age-matched dyad. All participants except for participant A used confirmation questions, however not every participant used information seeking and tag questions.

Table (25) *Shows the raw number of questions used by YA in the age-mismatched dyad.*

Participant	Confirmation	Information seeking	Tag Question	Total
A	2	5	2	9
B	12	4	0	16
C	11	3	6	20
D	5	4	1	10
F	1	0	1	2
G	12	1	3	16
H	4	0	1	5
Total	47	17	14	78

The age-mismatched dyad consisted of 78 instances of questions. All participants used confirmation questions and likewise to the instances in the age-matched dyad there are some participants who do not use all question functions.

Table (24 and 25) illustrate that all YA use more questions when communicating with an OA compared to a YA. The only participant who does not adapt their speech when speaking to an OA is participant H who uses the same number of questions in both dyads (N =5).

All instances of questions were divided by attitudinal groups for a comparison to be made. Positive attitude YA less questions in the age-matched dyad (N = 24) (table 26) compared to the age-mismatched dyad (N = 55) (table 25) Overall, positive attitude YA used over 50% more questions when communicating with an OA compared to YA.

Table (26) *Raw number of questions used in the positive age-matched dyad.*

Positive attitude group	Confirmation	Information seeking	Tag Question	Total
A	0	0	1	1
B	5	2	1	8
C	5	0	1	6
D	5	0	4	9
Total:	15	2	7	24

Table (26) shows confirmation questions were used the most for all participants (N = 15). Despite this in total fewer confirmation (N= 15) information seeking (N = 2) and tag questions (N = 7) are used in the age-matched dyad that the mismatched dyad, seen in table (23).

Table (27) *Raw number of questions in the positive age-mismatched dyad.*

Positive attitude group	Confirmation	Information seeking	Tag Question	Total
A	2	5	2	9
B	12	4	0	16
C	10	3	7	20
D	5	4	1	10
Total:	29	16	10	55

The question function used the most in this dyad was a confirmation question (N = 29). Confirmation questions used with the OA consisted of several '*can you see*' style questions as seen in table (28).

Table (28) *Confirmation questions.*

Participant	Question function	Example
C	Confirmation	Can you see the cones that are on the side of the house?
D	Confirmation	Do you see the blue building?
B	Confirmation	Can you see where the plants are?

The questions in table (28) exemplifies that the participants commonly asked closed-style questions inviting a yes / no response. However, there were 16 instances of information seeking question, allowing the OA to give a detailed response. Although information seeking questions did occur, such as wh- questions, '*what can you see?*' or '*what is around you?*' they were less common. Information seeking questions were typically asked by the younger adult to the older adult when the OA expressed confusion. For example, see table (29).

Table (29): *Information seeking question instances.*

Participant	Dialogue example
A	**OA:** …I don't know if we are both talking about the right, the right hospital? **Participant A:** Okay so what can you see? What is around you?
B	**OA:** …I think I've gone the wrong way here…I think at the red building we've got muddled up. **Participant B:** So where are you on that road?

To summarise, participants who had a positive attitude towards OA increase their use of all question types when communicating with an older adult compared to a younger adult.

Next, table (29) and (30) show a comparison of the negative groups' use of questions across the age dyads. Overall, the YA with a negative attitude collectively used more questions when communicating with OA compared to YA, notably not every participant had instances of using each question function.

Table (29) *Questions used by negative attitude YA in the age-matched dyad.*

Negative attitudes	Confirmation Questions	Information seeking Questions	Tag question	*Total*
F	2	2	0	4
G	9	0	0	9
H	4	0	1	5
Total	15	2	1	18

YA with a negative attitude in the age-matched dyad use confirmation questions the most (N= 15). Information seeking (N = 2), and tag questions (N =1) are used limitedly. Participants with the negative attitude mainly rely on the confirmation yes/ no answer questions.

Table (30) *No. of questions within the negative attitude age-mismatched dyad.*

Negative attitudes	Confirmation	Information seeking	Tag question	Total
F	1	0	1	2
G	12	1	3	16
H	4	0	1	5
Total	17	1	5	23

The negative attitude age-mismatched dyad used 23 questions in total, using confirmation questions the most frequently (N= 17). Tag questions are used limitedly (N =5) while only one participant used an information seeking question. The information seeking question used by participant G can be seen in example (7).

(7) information seeking question in an age-mismatched dyad:

    A. Participant G: Which ones are you looking at? There is two.

Although this question has been classified as an information seeking question, the speaker is limiting the listeners response to only 1 of 2 answers due to the 'there is two' phrase after the question has been stated. Even though the participant asked a wh-question, due to the

utterance stated after the question it seems the YA did not want an in-depth response from the OA.

All participants used at least one tag questions within this condition too. This included statements which had 'yeah' or 'okay' attached to the end of the utterance with rising intonation to indicate asking a question, as seen in example (8).

(8) Tag question usage in the mismatched condition.

A.   Follow that road, okay?

B.   Then go right for 3 trees, yeah?

C.   So that's the start point, okay?

Finally, the relative frequency of the confirmation, information, and tag questions, seen in table (31) showed that both the positive and negative group use confirmation questions over half of the time. The biggest difference is the relative frequency of information seeking questions as the negative group use a lot less (5%) compared to the positive attitude group (29%)

Table (31): *Overall distribution (%) of question functions.*

Attitude	Confirmation	Information Seeking	Tag question
Positive	55%	29%	16%
Negative	74%	5%	22%

Overall distributions in %				
	Confirmation	Information seeking	Tag question	
Positive	55%	29%	16%	
Negative	74%	5%	22%	

5. Discussion

The study posed the question; 'do the positive or negative attitudes of YA towards OA affect the frequency usage of selected linguistic features associated with elderspeak, specifically the

measures of fluency and speaker style?' To investigate this, I conducted a referential communication activity and compared the results based on the participants attitudinal score calculated from the Refined Aging Semantic Differential Scale (Polizzi, 2003). This study's main aim set out to investigate whether the attitude a YA had towards OA could affect the frequency usage of sentence fragments, repetitions, and questions. The conclusions set out in section (4) highlight that the attitudes YA have towards OA can affect each linguistic variable differently. Additionally, there will be a comparison between age dyads, to judge the alignment with Kemper (1994) and Kemper et al (1995).

Therefore, to meet this aim I hypothesized the following:

1. All YA will use shortened utterances and more instances of repetitions, sentence fragments and questions when communicating with OA compared to when they communicate with YA.

The current study results fully support Hypothesis 1; This agrees with Kemper (1994) who found care givers and service providers used more sentence fragments when communicating with OA opposed to YA however, the use of tag questions did not change within their study. Although Basque suggests that tag questions can be an elderspeak marker, however this is not an exclusive categorisation (2020). All linguistic variables had an increase of usage and the MLU was shortened when the YA communicated with OA opposed to YA (Table 10) This agrees with Kemper, et al findings that YA shorten utterances but produced more words and utterances when communicating with OA alongside the increase of repeated instructions (1995: 51).

Whilst Kemper et al (1995) suggests YA did not accommodate to the OA, the YA within the current study did modify their speech when communicating with the OA due to the difference between the uses of each linguist predictor between dyads. Like Kemper (1994) in the current study the YA significantly increased their use of complete and sentence fragments in the age-mismatched dyad (table 14). When examining the use of fragmented speech, results showed all participants increased in usage but with varying amounts. (Table 11 and 12). Whilst analysing the use of repetitions no significant difference between the behaviour across the age dyads was seen. However, there was an increase in the average number of repetitions in

the mismatched dyad (6) opposed to the matched dyad (2.7) (Section 4.4.1). Finally, YA increased their overall usage of all questions and individual question functions when communicating with an OA (Table 24 & 25). Following the review of literature, particularly the work of Kemper et al (1995), this study predicted that regardless of attitude, the YA would increase their usage of elderspeak markers when communicating in comparison to the age-matched dyad group. The raw numbers for all instances of the linguistic variables show this to be true.

The Inter-group over Accommodation theory (Ryan et al, 1986) offers a sound explanation of why results show the YA modifying their speech in an age-mismatched dyad. YA over-accommodate, thus causing intergroup breakdowns (Ryan et al, 1986), based on stereotypical assumptions of particular social groups. YA are modifying their speech simply because the OA they are communicating with are part of the perceived homogenous OA group. As Ryan et al, 1986 explained, the modifications are based on stereotypes of OA and do not always coincide with the actual needs of the OA. While this example illustrates why YA over-accommodate when speaking to OA, it also explains why results are in accord with Hypothesis 4 yet are at variance with 2 and 3. The work of Ryan et al, (1986) should be considered with an appreciation that studies at the time were invested in the impact of negative stereotypes, whilst more recent literature accepts that stereotypes can be both positive and negative of OA which in turn some elderspeak can positive and beneficial for OA (Cuddy and Norton, 2005).

The results do not support Hypothesis 2 and the null hypothesis cannot be accepted either. The current study findings show YA with a positive attitude towards OA, increased their use of both full and partial repetitions the most, compared to the repetitional use within the age-matched dyad.

2. YA with a negative attitude towards OA will use a higher number of repetitions when communicating with the OA compared to the YA with a positive attitude towards OA.

Whilst predicting that the negative group would use more repetitions, it was surprising that the positive attitude group, on average used 7.8 instances of repetitions whereas the negative attitude group used on average used 4 instances in the age mismatched dyad (Section 4.4.1). It could be suggested that the positive attitude group were trying to improve the clarity of

instruction, however it cannot be determined if this was a deliberate or unconscious choice. This would suggest that the positive attitude YA are over-accommodating more when speaking to the OA, however Thomas (2010) suggests there are both positive and negative aspects of elderspeak, specifically paraphrasing and repetition, which can improve OA comprehension (Kemper, 2001). The participants within the positive attitude group used some partial repetitions with the function to correct their instruction, seen in table (23) in section (4.4.1). This correction aligns with the fact that it is improving OA comprehension as the YA were correcting themselves and clarifying what they meant, as well as repeating location checking statements more to the OA, opposed the YA with a negative attitude.

Results presented in section (4.4.2) disagree with hypothesis 3.

3. YA (YA) with a negative attitude will use a higher number of questions when completing the referential mapping activity with the OA (OA)compared to the YA (YA) with a positive attitude.

Overall, positive attitude YA increased the number of questions they asked the OA, compared the YA within the negative attitude group. Even though there was limited research surrounding different types of questioning, specifically in relation to elderspeak, the question function that the positive group used a lot more than the negative group, was information seeking questions (Table 24 -27). These open-ended questions examples in table (32) allow for a more conversational dialogue to occur between the YA and OA in the age-mismatched dyad indicating that the YA were making a concerted effort to clarify locations for the OA to follow.

Table (32) Information seeking example.

Participant	Questions
A	So where are you?
B	What can you see?
C	Which direction are you going?

As seen in table (32), it was common to see the OA repeat instructions when they were confused, or ask questions to clarify, compared to the YA who typically this less frequently and often replied with 'yeah' or 'okay'. Therefore, this could suggest that any perceived confusion was in fact the trigger which caused the increase of questions within the positive attitude group. As there were only 2 instances of information seeking questions in the negative age-matched dyad and 1 instance within the age-mismatched dyad, this could indicate that the negative attitude group did not pick up on these confusion ques, thus typically resorting to closed questions in response to address any confusion.

The results align with Hypothesis 4, evidencing that the negative attitude group did use more instances of fragmented speech compared to the positive attitude group within both age dyads.

4. YA with a negative attitude towards OA will increase the amount of sentence fragments used when speaking to OA compared YA with a positive attitude.

Overall, there was a significant difference between the behaviours of the positive and negative attitude groups' use of complete sentences and sentence fragments. While both groups increased their use of sentence fragments when communicating with OA the percentage increase was largest within the negative attitude group. When looking at a minimal pair, participant H typically used a complete sentence with the YA the equivalent instruction was broken into sentence fragments when the YA was communicating the OA. Kemper (1994: 26) suggested that the increase in sentence fragment was sensitive to 'mental status and presumably communicative competence of the addressee'. This could by why the negative attitude group are using more fragmented speech as they perceived that the OA, they were communicating with had lower mental competency. However comparative predictions could not be based on this study alone as the OA in the current study does not have dementia therefore the age ques presented may be different to Kemper 1994. Participants with the negative attitudes could also have simply been over-accommodating with the OA and modifying their communication based on stereotypical assumptions of need, as the Communication Accommodation Theory and CPAM (Ryan, 1986) would suggest, this is further supported by Abramson and Silverstein (2006) who found YA particularly perceived OA to have a defective memory. Therefore, it is likely they will try to accommodate their speech due to the stereotypical perceived ideas even if this is not true of the OA they are

communicating with. Overall, the fragmented speech results can be explained since elderspeak is largely based on the negative stereotypes that OA are dependent and less competent therefore YA simplify their speech (Ryan et al, 1995).

5.1 Study implications

Firstly, while the sample size of the current study is relatively small, the scores of the Aging Semantic Differential Scale (Polizzi, 2003) show 3 out of 7 of the participants portray positive attitudes towards OA. Therefore, while the consensus in literature is that YA have negative attitudes towards aging and OA (Cuddy, et all, 2005, Nosek et al 2007, Bousfield and Hutchinson, 2010), more should be done to acknowledge that this is a generalisation, ringfencing YA in a homogenous group and this small-scale study suggests otherwise. It does, in fact, evidence that YA have differing attitudes towards OA, highlighting the implications of the relationship between attitudinal groups and the linguistic variables. For example, there is a significant difference between the attitudinal groups use of complete sentences and sentence fragments, illustrating that attitudes can affect the usage of elderspeak markers.

5.2 Study Limitations

Sample bias could have occurred due to use of opportunity sampling. If the study was repeated, stratified sampling may provide a more diverse sample range and remove bias, that could impact results. Furthermore, a larger sample size would be beneficial, this would increase the chance of having a wider range of attitudinal scores. Despite having 2 groups, the participants' attitudinal scores ranged between 2.1 and 4.8. This range does span both groups, however with a larger sample, we might see a broader range of results across the whole scale (1-7) and stretching to the extremes. An increase in sample size would also provide more token instances for each linguistic variable, allowing for statistical testing of all linguistic variable. To further extend this study and allow for deeper examination of results the addition of more OA is recommended. It would be of interest to have a sample containing both sexes to examine if this influences elderspeak. An analysis of the accuracy of the drawings taken from the referential mapping activity could also be a useful addition and would allow for conclusions to be made surrounding if the increase in repetition was beneficial to the OA's comprehension, like Thomas (2010) suggested and we would be able

to make inferences about how a positive attitude could cause a YA to be a better communication partner.

6. Conclusion

This study aimed to investigate how YA' positive and negative attitudes towards OA affected the frequency usage of elderspeak markers, specifically measures of fluency and speaker style, whilst also comparing the results to those of Kemper et al 1995. From conducting a mixed method study and partially replicating Kemper et al 1995 referential mapping activity, it is concluded that YA attitudes towards OA does affect the frequency usages of elderspeak markers: specifically, complete and sentence fragments, repetitions, and questions. This therefore means hypothesis (1) has been accepted and there are similarities between the current study and Kemper et al (1995). Overall, it is evident that there is a significant difference between the attitudinal groups' use of complete sentences and fragments, whereby the negative attitude group uses more complete and sentence fragments compared to the positive attitude group, meaning hypothesis (4) has been accepted. However, hypothesis 2 and 3 have been rejected because the positive attitude group use more instances of questions and repetitions than the negative attitude group which was not predicted. Although this does not agree with the majority of literature presented it emphasises the point that there is a gap in research of understanding how YA attitudes can affect the usage of elderspeak.

As a vast majority of research based on elderspeak has been conducted in the healthcare sector (Kemper 1994), it would be insightful to develop this small-scale study further, in a non-institutionalised context, to build on the work of Kemper et al (1995), who focused their research beyond healthcare boundaries and therefore, had greater relevance as a benchmark for this research. This study has laid the theoretical foundations, built on sound empirical research, to provide a pathway for future studies, which, in turn, could strengthen understanding and means of communication, across the generations and the rapid ageing population (National Office of Statistics, 2011, Age UK, 2023). Furthermore, future work can also focus on the role of the interlocutor in shaping the use of elderspeak.

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8. Appendices

Appendix 1: Younger adult questionnaire.

Inter-generational attitudes and language use
Welcome!

This study is on the perception and attitudes surrounding ageing and how this affects language use. This research is conducted by Chloe Rogers at Newcastle University, under the supervision of Dr Heike Pichler and Michelle Sheehan.

Below, you will be asked several questions relating to ageing, older adults, and younger adults. There will also be questions asking some personal information purely for the purpose of linking different parts of the study; this information will be pseudonymized when the project is written about. Your answers are for research purposes only.

The questionnaire will take approximately 10 minute to complete. Please answer all the questions honestly. It is best to answer the questions quickly, as soon as your initial answer comes into your head.

After you have completed the questionnaire, you will be contacted to arrange the initial Zoom activity which will take place in January 2024.

Please click the link below for detailed additional information about the study. https://tinyurl.com/bdd77yfa

- Required

Consent

1. **By Clicking 'agree' below, you declare that:**

    You are 18 years of age or older.
    You have read and understood the detailed additional information about the study, which you can download from the link above and retain for your records.
    You agree that your pseudonymized data may be used for Chloe Rogers' undergraduate dissertation.
    You voluntarily agree to participate and understand that you can stop or withdraw from participation at any time before the research is completed (which is planned to be on 01/ 05/2024).

    Click 'agree' below to begin the study. If you don't agree to these terms and don't wish to participate, you can simply close this window.
    *

Personal Information

In order for questionnaire data to be linked to your mapping task performance, I need to ask you some personal information. Please note that this information is used purely for the purpose of linking different parts of the study. Your name will never be used when I write about this study.

2. First Name *

3. Age: *

4. Do you live in Yorkshire? *

5. What is the date you are completing this questionnaire?

Your own experience surrounding **Ageism** and **Stereotypes.**

Ageism: Discrimination that is based on someone's age based on stereotypes and prejudice.

Stereotype: A fixed and oversimplified image or idea of a particular type of person.

6. Have you ever experienced discrimination because of your age? *

7. Have you ever experienced discrimination because of your age? *

8. What is a stereotyped view Older Adults may have about Younger Adults? (e.g. they are all vegan). *

Attitudes towards Older Adults

In the section below question (8 -19) shows 12 sets of polar opposite adjectives.

Using the 7 point scale for each set of adjectives please select a point that best represents your viewpoint and judgement of
older adults. Point 4 on the scale would result in a neutral opinion or where you are unable to make a decision.

*An adjective is a describing word. In this case the adjectives are describing an **older adult**

8. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Pleasant   Unpleasant

9. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Friendly   Unfriendly

10. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Kind   Unkind

11. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Nice   Mean

12. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Tolerant   Intolerant

13. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Unselfish   Selfish

14. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Considerate   Inconsiderate

15. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Thoughtful   Thoughtless

16. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Optimistic   Pessimistic

17. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Grateful   Ungrateful

18. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Patient   Impatient

19. *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Cooperative   Uncooperative

Perception of younger adults

21. Please write **<u>3 words</u>** that you would typically use to describe a Younger Adult. *

The Older Adult Population.
In the section below check one box to the right of the statement that best corresponds to how you feel about the statement concerning older adults in general.

22. Question *

	Definitely True	Somewhat True	Somewhat False	Definitely False
When people get older, they need to lower their expectations of how healthy they can be	○	○	○	○
The human body is like a car: when it gets old it gets worn out.	○	○	○	○
Having more aches and pains is an accepted part of aging	○	○	○	○
Every year that people age, their energy levels go down.	○	○	○	○
I expect as I get older I will spend less time with my family.	○	○	○	○
Being lonely is just something that happens when people get old.	○	○	○	○
As people get older they worry more.	○	○	○	○
It's normal to be depressed when you are old.	○	○	○	○
I expect as I get older I will become more forgetful.	○	○	○	○
It's an accepted part of ageing to have trouble remembering names.	○	○	○	○
Forgetfulness is a natural occurrence just from growing old.	○	○	○	○
It is impossible to escape mental slowness that happens with ageing.	○	○	○	○

Final Consent:
23. Do you give consent to take part in 2 online Zoom meetings in January 2024. For more details please read the Participant Information Sheet:

   https://tinyurl.com/bdd77yfa

   *
   Yes
   No

Appendix 2: Example of the YA hypothetical town map. Each YA had the same town with a different red drawn route and the OA had several copies of the blank map.

Appendix 3: ERA -12 Likert scale points system.

Likert scale statement	Points System			
	Defiantly True	**Somewhat True**	**Somewhat False**	**Defiantly False**
When people get older, they need to lower their expectations of how healthy they can be	1	2	3	4
The human body is like a car: when it gets old it gets worn out.	1	2	3	4
Having more aches and pains is an accepted part of aging	1	2	3	4
Every year that people age, their energy levels go down.	1	2	3	4
I expect as I get older I will spend less time with my family.	1	2	3	4
Being lonely is just something that happens when people get old.	1	2	3	4
As people get older they worry more.	1	2	3	4
It's normal to be depressed when you are old.	1	2	3	4
I expect as I get older I will become more forgetful.	1	2	3	4
It's an accepted part of ageing to have trouble remembering names.	1	2	3	4
Forgetfulness is a natural occurrence just from growing old.	1	2	3	4
It is impossible to escape mental slowness that happens with ageing.	1	2	3	4

Appendix 4: YA Refined Aging Semantic Differential scale (Polizzi, 2003) scores and participants average overall scores.

Participant	Pleasant - Unpleasant	Friendly - Unfriendly	Kind - Unkind	Nice - Mean	Tolerant - Intolerant	Unselfish - Selfish	Considerate - Inconsiderate
B	5	2	3	3	3	4	2
D	2	2	2	2	4	2	2
H	5	6	4	4	7	4	6
A	2	2	2	3	5	4	3
F	4	3	4	4	6	5	6
G	4	4	4	3	6	3	4
C	2	2	1	2	1	2	3

Participant	Thoughtful - Unthoughtful	Optimistic - Pessimistic	Grateful - Ungrateful	Patient - Impatient	Cooperative Uncooperative	Average
B	2	3	3	3	3	3.0
D	2	1	4	5	2	2.5
H	5	6	3	3	5	4.8
A	3	5	2	4	4	3.3
F	3	6	5	7	4	4.8
G	3	7	4	7	5	4.5
C	2	3	3	2	2	2.1

Appendix 5A: Examples section of Participant C age mismatched transcript dialogue. (Positive attitude towards OA)

OA: 4 Christmas trees, oh yeah 4 and 3. I'm in the middle of the road. I've got the 4 to one side of me and the 3 to the other.

Participant C: Yeah, perfect. And then you want to walk down that road all the way to the end of the road and then you hit the edge of the map.

OA: Okay Yes, yeah, yeah.

Participant C: And then we want you see that singular kind of Christmas tree by itself.

OA: Yeah.

Participant C: Yeah. And so, you want to walk to the back of that. [complete] So, we're going off the road here. So, you want to walk to the back of that, and then walk all the way around it till you hit the edge of the zebra crossing on the road. [complete] Can you kind of see that?

OA: Yes, I've got to it.

Participant C: Yeah. So yeah, we just kind of wanna walk around the back of that. I think and then we get to that zebra crossing and we cross over into the middle of the 4 Christmas trees that are in front of us.

OA: Yes, right I'm there.

Participant C: perfect, so we'll be in the middle of them, and then you want to turn left. And now you'll be facing another direction still in the middle.

OA: turn left. Just turn round.

Participant C: Yeah, turn left.

Participant C: and then you want to go forward and that should be another zebra crossing in front of you a new zebra crossing we've not got to yet.

OA: yes.

Participant C; So now, can you see 2 Christmas trees together?

OA: Yes yes.

Participant C: Yeah, perfect. And then you want to take a right to the you want to take a right. So now you're going down the road. But you only want to go to the first junction If that makes sense. So, you kind of just stop there.

OA: Yeah, so stop there.

Participant C: So, stop in the middle of the first junction. [complete] And then we want to take a right onto that zebra crossing and stop at that zebra crossing.

OA: Yes. Okay,

Participant C: yeah. So now you'll have sort of kind of like kind of a bit like a hospital on your left.

OA: Yes Yeah.

Participant C: So, the hospital is the midpoint. I don't know if you need to jot that down, or?

OA: Well, I'll just scribble in so we know.

Participant C: So, if we go, if we kind of enter the hospital. So if you take a left and enter the hospital from kind of looks like the window. But we'll just, you know.

OA: Yeah Yeah.

Participant C: So, we go into the hospital. And I would just in the hospital. And then we want to exit this hospital from the front of the hospital so out where kind of the steps are in 40

OA: yes. Yeah.

Participant C: Okay. So now we're facing that way. So, you go to a square white building in front of you with 6 glass panels.

OA: Yea.

Participant C: Yeah. Okay. So now, walk out onto that zebra crossing straight in front of the hospital.

Appendix 5B: Examples section of Participant C age-matched transcript dialogue. (Positive attitude towards OA)

Participant C: Yeah. Yeah. And then that that's what we want to do. We want to walk towards the 2 cones at the edge of the map. Kind of they're like on a diagonal to each other, I suppose, and then you want to carry on, following the road round past the Forklift truck thing and the hay bale.

Participant B: Yep.

Participant C: And then you carry on until there's another 2 cones in the middle of the road and then you want to take a left. I suppose and you should cross a crossing all the way to the down that road till you hit the edge of the map kind of. Do you see that road?

Participant B: down instead of towards that building with the red?

Participant C: Oh, yeah. You don't go past that you come left past the trees and to the edge of the map.

Participant B: yep.

Participant C: Okay? And then there should be a singular tree by itself.

Participant B: Mhh.

Participant C: And you want to walk around that tree. So, however, you want to draw it but you kind of just walk around that tree to the crossing back on the road.

Participant C: And then once you're back on that crossing. You want to walk in between the 4 trees and stop in the middle of the 4 trees.

Participant B: mmh.

Participant C: And then take a left and then you'll walk between 2 of the trees back on to the road and you should end on a crossing.

Participant B: Yup.

Participant C: okay and now you want to take a right and walk to do you see that junction? Just walk into the middle of that junction and then you want to take another right and you want to go towards that crossing with that white and red building on your left and stop on that crossing.

Participant B: right

Participant C: and then take a left. It kind of points into the building, the midpoint. So you going into the like hospital, it kind of looks like building.

Participant B: Yeah.

Participant C: And then, now it you leave that from the front so you see where the steps are kind of looks like the entrance?

Participant B: Yep.

Participant C: You leave it from there, you go on to that crossing on that road and then at that crossing you wanna turn left and then go up that road past the first junction you should hit another crossing and then at the second junction, stop.

Appendix 5C: Examples section of Participant H age-mismatched transcript dialogue. (Negative attitude towards OA)

Participant H: up to the other 2 corners.

OA: yes

Participant H: and then going left there, past the zebra crossing to the midpoint again.

OA: Yes.

Participant H: downwards.

OA: Yes. Now, when am, am I going over another zebra crossing?

Participant H: Yeah, go right to the end of the map.

OA: Yes

Participant H: and then left over that little bit of grass and past the 2 trees.

OA: Yes

Participant H: and then go right towards I think a bush with a bit of yellow on top of it. Yellow on top of it.

OA: A bus. It could be a bus or something, is it? That is it? Is it yellow at the top ring in the middle orange at the bottom.

Participant H: Yeah, so go to that.

OA: I've got to that. Yes,

Participant H: upwards to that building.

OA: Yeah, through the gateway. The entrance to it?

Participant H: Just stop at the windows.

OA: Stop at the windows, yes.

Participant H: and then right to the zebra crossing.

OA: Right? Yes.

Participant H: and then up to the midpoint.

OA: I don't know where the midpoint is.

Participant H: so, from the zebra crossing to where the road crosses again.

OA: Another junction. Yes.

Participant H: Yep, and then you're going left all the way down to that building bottom left corner.

OA: A little tiny green L shaped building. Is that the one you mean?

Participant H: It's green at bottom, and then it's got some big windows and green on top.

OA: A big window is just a bit. And is it? Is there? 3 zebra crossings on that lane on that road?

Participant H: Yeah. Yeah. And there is two windows together in the bottom left corner.

OA: Yes yes.

Participant H: So you're at that building the mid-point.

OA's iPad 6th: Okay?

Participant H: And then from that building so, the right-hand side of the building is a zebra crossing.

OA: Yes, is that is the the right-hand side of that building. Is that the one on the road opposite the police station?

Participant H: Yeah. Okay. So, from there. Just up to the road on the right. So, there's a crossing covered by the building.

OA: A crossing, covered by the building. When I turn right there am I on zebra crossing at the far side of the police station

Participant H: yeah.

OA: at the top side of the police station. Right? Okay?

Participant H: And then so near the police station, are you at a cross at like the junction in the road again?

Appendix 5D: Examples section of Participant H age-matched transcript dialogue. (Negative attitude towards OA)

Participant H: Go through both trees down to the white.

Participant D: Yeah.

Participant H: And then from the white we are following up the road. Then we will get to the end of that road left wise.

Participant D: Yeah, that's fine. Wait. Am I on the road, or am I just going next the road?

Participant H: Yeah, it's come to a corner, on the road.

Participant D: Oh yeah.

Participant H: Yeah, on the road now.

Participant D: Yeah. Got it.

Participant H: And then go down to the middle of the junction. the cross.

Participant D: Yeah.

Participant H: And then turn right at the white part, go past the cones.

Participant D: Past the cones?

Participant H: yep, go past the cones, like the little sand.

Participant D: Oh, so it's cutting like straight through the digger?

Participant H: Erm, It's just on the edge of the white and the road, So, it's like just missing it.

Participant D: Okay, yeah, I got what you mean.

Participant H: So just like a little bit past the sand on the grass.

Participant D: Yeah.

Participant H: And then the tree that's next to it. Should be just a little bit past that tree.

Participant D: Yeah.

Participant H: And then we'll go in diagonal up to the second tree.

Participant D: Yeah, is it the second tree in a row?

Participant H: The one diagonal above it.

Participant D: Okay, yeah,

Participant H: yeah. Not the actually the one a little bit over.

Participant D: Yeah.

Participant H: And then when we're at that one. You go right diagonal for one length of a tree.

Participant D: Got it? Yeah. Yeah.

Participant H: And then up from there to the white part near the road.

Participant D: Yeah.

Participant H: And then right diagonal, just to the end of the map.

Participant D: Yeah.

Participant H: And then from there it goes, really far down.

Participant H: Past the grass, past the white to just a little bit of the white left at the bottom.

Participant D: So, like, just before the 2 cones?

Participant H: Yeah, just before there. Yeah.

Participant D: okay, got it.

Participant H: And then it goes a little bit diagonal left to that first crossing.

Participant D: Yeah.

Participant H: and then go down to where the end of the road and then turn left from there to the junction.

Participant D: Yeah.

Participant H: Go downwards to the other cones that are at the end of the page again.

Participant D: Wait. I've got myself confused downwards towards the cones?

Participant H: Yeah. So, we're at the, are you in the middle where the junction is?

Participant D: Yeah.

Participant H: Yeah just go diagonal down, to the 2 at the end of the map.

Participant D: yeah.

Participant H: Yeah, go left to the middle of the junction again.

Participant D: Yeah.

Participant H: Go up to the cones. Then turn left to the other junction.

Appendix 6: ERA-12 participant responses.

Participant	When people get older, they need to lower their expectations of how healthy they can be	The human body is like a car: when it gets old it gets worn out.	Having more aches and pains is an accepted part of aging	Every year that people age, their energy levels go down.	I expect as I get older I will spend less time with my family.	Being lonely is just something that happens when people get old.
B	Somewhat False	Somewhat False	Somewhat False	Somewhat True	Somewhat False	Somewhat False
D	Definitely True	Somewhat True	Definitely True	Somewhat False	Somewhat False	Somewhat False
H	Somewhat True	Somewhat True	Somewhat True	Somewhat False	Definitely False	Definitely False
A	Somewhat True	Somewhat True	Somewhat True	Somewhat False	Somewhat False	Definitely False
F	Somewhat True	Somewhat True	Somewhat True	Somewhat True	Somewhat False	Somewhat False
G	Somewhat False	Somewhat True	Definitely True	Somewhat True	Somewhat False	Somewhat True
D	Somewhat True	Somewhat True	Definitely True	Somewhat False	Somewhat False	Somewhat True

Participant	As people get older, they worry more.	It's normal to be depressed when you are old.	I expect as I get older, I will become more forgetful.	It's an accepted part of ageing to have trouble remembering names.	Forgetfulness is a natural occurrence just from growing old.	It is impossible to escape mental slowness that happens with ageing.
B	Somewhat True	Somewhat False	Somewhat True	Somewhat False	Somewhat True	Somewhat False
D	Somewhat True	Somewhat True	Definitely True	Definitely True	Somewhat True	Definitely True
H	Somewhat False	Definitely False	Somewhat False	Somewhat False	Somewhat False	Somewhat True
A	Somewhat True	Somewhat False	Somewhat False	Somewhat False	Somewhat False	Somewhat False
F	Somewhat False	Somewhat False	Somewhat True	Somewhat True	Somewhat True	Somewhat False
G	Somewhat False	Somewhat False	Somewhat True	Somewhat True	Somewhat True	Somewhat False
D	Definitely True	Somewhat True	Definitely True	Somewhat True	Definitely True	Somewhat True