Subtitles in authentic video listening:

An exploration of the benefits of captions in relation to sensory preference types

Author's Name: Robert Hicking

University College London

Subtitles in authentic video listening: An exploration of the benefits of captions in relation to sensory preference types.

Dissertation as part of the MA in Teaching of English to Speakers of Other Languages

Word count: 15,623 words

MA in Teaching of English to Speakers of Other Languages

September 2015

Abstract

Improvement in broadband reliability has led to a growing interest in the use of authentic video in the classroom. Research into the benefits of authentic video has been constrained, however, by limited evidence for the lexical coverage required to facilitate adequate listening comprehension. This study investigated the effect of captioning on second language (L2) learners' listening comprehension and vocabulary acquisition when watching authentic video. In addition, the study examined whether learners' sensory preference type moderated the relationship of captioning to listening comprehension and vocabulary acquisition.

Data were collected through a self-assessment questionnaire (to identify sensory preference type), as well as tests of listening comprehension and active vocabulary recall and recognition. Both groups viewed the video clips twice, with the experimental group provided with captions for the second viewing. 50 participants, at a B2 level, were involved with numbers evenly split between the two groups.

Analysis of independent samples *t*-tests showed a clear advantage for L2 learners when viewing with captions. In addition, Pearson correlations between sensory preference style and test performance indicated that learners with an auditory preference style benefit less from captions than those with other sensory preference styles.

The study highlights some important implications for future research. Firstly, the lexical coverage required for successful listening comprehension should be explored through empirically driven research. Secondly, further research into sensory preference type is warranted, due to mixed findings in previous studies; moreover, a reliable, user-friendly

questionnaire needs to be constructed. In addition, the relationship between the effects of

captions and sensory preference type could be further explored.

From a pedagogical perspective, the identification of learners' sensory preference styles can

highlight possible mismatches between learning style and language task. Furthermore, use of

authentic video can encourage the teacher to introduce themes that are relevant and

interesting to their learners. As the use of captions has been seen to be beneficial, successful

classroom listening may well induce learners to watch further content outside the classroom,

thereby encouraging learner autonomy.

Table of Contents

1. INTRODUCTION

1.1 Background and motivation for the research

When working with my students on ways to develop their second language (L2) skills, I have often found the focus on improving listening skills the most rewarding as learners often find listening a frustrating experience (e.g. Graham, 2006). I am always keen to encourage learners to access authentic material such as DVDs and television recordings, and would like to find out how helpful captions (subtitles in the same language as the listening) are to learners when watching video-based content in a second language. It has been suggested that using multimedia in the L2 classroom supports the cognitive processes by enhancing the comprehensibility of the spoken and visual input (Plass and Jones, 2005), thereby offering practitioners an effective tool for classroom practice (Grgurović and Hegelheimer, 2007; Vanderplank, 2013). The significant increases in broadband speed and reliability over the last decade have also allowed many teachers to access online content (e.g. YouTube) via interactive whiteboards, thus opening up a wealth of material to use in the classroom.

The use of video with captions not only exposes learners to the L2 both aurally and visually but may help them develop listening comprehension skills and acquire new vocabulary (Winke, Gass and Sydorenko, 2010). From the early 1990s, studies have been conducted to ascertain whether learners benefit more from captioned rather than uncaptioned video (e.g. Garza, 1991; Markham, 1999) and, according to Winke, et al. (2010: 66), the "general consensus was that captioning leads to superior performance on subsequent comprehension and vocabulary tests". There is some debate though concerning multi-modality input (video, audio and captions together) and whether it results in cognitive overload (e.g. Mayer and

Moreno, 2003) caused by difficulties in processing two types of visual input simultaneously. Such claims of cognitive overload, however, may lack clear empirical evidence (Winke, Gass and Sydorenko, 2013) and reflect studies conducted with native speakers who may well find captions distracting as they are unlikely to need the extra support that captions provide. Beneficial links between bimodal presentation and learning have, though, been firmly established. For example, Bird and Williams (2002) found that when learners were presented with vocabulary through text and sound simultaneously, they displayed enhanced recognition memory compared to when text was presented without sound and sound without text. A further consideration is the lexical threshold required to enable learners to understand authentic video content. As empirical research into the lexical coverage needed to ensure successful listening comprehension has been extremely sparse, researchers have often turned to data derived from reading comprehension to provide a comparison.

Using authentic video material such as DVDs and television helps to engage learners (Wilson, 2008), and anxiety can be reduced if learners are able to visually confirm what was heard (Vanderplank, 1988). This study investigates the benefit of using captions with authentic video in terms of aiding listening comprehension and vocabulary recognition and recall. The study also focuses on the extent that captions enhance listening performance for different types of learners. The taxonomy of individual differences (IDs) is well founded – "IDs have been found to be the most consistent predictors of L2 learning success" (Dörnyei, 2005: 2). However, as Ellis (2004) notes, the concept of individual differences encompasses so many different areas (language aptitude, learning style, motivation, anxiety, personality, learner beliefs and learning strategies), and the debate over learning style is as yet undecided (Dörnyei, 2005), the focus on IDs in this study will be narrowed down to sensory preference type (visual, auditory and kinaesthetic). Sensory preference reflects the ways learners prefer

to receive input, with visual learners, for example, benefiting from activities such as reading and looking at images. Many learners though may not have a dominant preference and may benefit from input through all three modalities. This study employs a questionnaire to establish learners' sensory preferences and then uses captioned video to test listening comprehension and vocabulary acquisition, comparing the test findings to sensory preference type in order to see if there is a link. The research could be of benefit to classroom practitioners who would be able to choose whether, or how often, to use captions with their students based on identification of their learner sensory preference type.

1.2 Rationale

Over the last few years the use of captioned video in the classroom has increased considerably. A number of studies have been undertaken to assess various ways of measuring the effectiveness of captions when accompanying video and audio. For example, studies have been carried out exploring how the combination of captions, sound and pictures can help improve listening comprehension (Markham, 2001; Winke, et al., 2010) or vocabulary acquisition (Nation, 2001). Further research has been conducted on the different benefits between the various modes of input (Sydorenko, 2010), whether viewers benefit more from reading or listening and what visuals learners focus on (through eye-tracking) (Winke, et al., 2013). Other studies have been based around the percentage of vocabulary that would need to be known in order to facilitate comprehension (Van Zeeland and Schmitt, 2013) and word recognition (Markham, 1999; Bird and Williams, 2002). Vanderplank (1990) looked into individual strategies used by learners when watching captioned video, while Montero Perez, Peters, Clarebout and Desmet (2014) determined whether learners benefit more from full captioning or key word captioning. In a further study, Grgurović and

Hegelheimer (2007) explored how learners chose between using subtitles (captions) and transcripts in order to aid comprehension. In addition, other researchers have considered how different levels of proficiency (Winke, et al., 2010), age, nationality and gender can affect the benefit of using captions. I am not aware though of studies linking learner preference to the benefits obtained from using captioned video and have therefore decided to combine two areas of interest in this study.

In the following section, I will review the literature covering sensory preference styles, the use of captions and the benefits of captioning on developing listening skills. At the end of the literature review I will introduce the research questions that this study raises. Chapter Three describes the methodology employed in the study, while Chapter Four presents the results. The findings are then discussed in Chapter Five and limitations relating to the study are highlighted in Chapter Six. A final concluding chapter summarises the findings and suggests implications for future research before ending with a description of pedagogical implications.

2. LITERATURE REVIEW

This chapter is divided into six sections. The first section presents the difficulties involved in defining a learning style and explores other related theoretical concerns, under the umbrella of individual differences. This is followed by an exemplification of the sensory preference categorisations (visual; auditory; kinaesthetic and tactile) and key studies that incorporated this taxonomy. Next, a brief overview of how captions may aid the development of listening skills precedes a review of some important findings on the acquisition of vocabulary through the medium of video listening with captions. In the fifth section, further studies on the

benefits of using captions with videos are summarised. The research questions are introduced in the final section.

2.1 Analysing learning styles

To understand the taxonomy of sensory preferences requires an understanding of the broader category of learning style, which in turn is encompassed within the far wider concept of individual differences. Ellis (2004: 530) divides IDs in L2 learning into four categories: abilities (intelligence; language aptitude; memory); propensities (learning style; motivation; anxiety; personality; willingness to communicate); learner cognitions about L2 learning (learner beliefs); learner actions (learning strategies). The sub-category learning styles is a particularly complex area, and definitions vary depending on the approach researchers take. Dörnyei (2005: 124) asks the question "Do learning styles really exist?" before responding "that we are not absolutely sure". One reason for this ambiguity is "that different learners can approach the same learning task in quite different ways" (Dörnyei, 2005: 122). What Dörnyei (2005: 124) emphasises, however, is that "we should make a clear distinction between learning styles and cognitive styles", and that the route to understanding what a learning style is depends upon a closer analysis of what cognitive styles are. Riding (2000: 365) believes that research into cognitive style can struggle to differentiate style, personality and intelligence and runs the risk of being termed vague. Despite this concern, Lincoln and Rademacher (2006: 486) inform that researchers "have found students' preferred ways of absorbing and processing information are divisible into the following categories: cognitive, affective, environmental, sociological, and sensory".

Riding's Cognitive Styles Analysis (CSA) (1991) incorporates a 'verbal-imagery' dimension as a subtest of a three stage computer-based test. The 'verbal-imagery' style dimension compares 'verbalizers' (i.e. those who tend to be outgoing and favour verbal information) and 'imagers' (those who prefer to create visual images internally) and therefore has similarities to the learning style dimension categorisation of 'sensory preferences'. Dörnyei (2005: 134) recognises, though, that Riding's CSA focuses on cognitive style rather than learning style, thereby allowing it "to target a narrower and more precisely definable domain". This differentiation is in contrast though to some other researchers who, according to Leite, Svinicki and Shi (2010: 324), "disagree about the nature of the relationship and the overlap between the concepts of learning styles, cognitive styles, and learning ability". Ehrman, Leaver and Oxford (2003: 314) argue that the "literature on learning styles uses the terms *learning style, cognitive style, personality type, sensory preference, modality,* and others rather loosely and often interchangeably". Leite, et al. (2010: 324) are concerned that there is a "major disagreement in the literature" as to "what type of learning preferences should be included under the umbrella of learning styles".

Dörnyei (2005: 131) brackets Kolb's Learning Style Inventory (LSI) alongside the CSA, with both instruments able to "do a reasonably good job" at assessing learner style. Dörnyei (2005: 129) describes Kolb's (1984) theory on learning styles as "one that has been widely endorsed by both researchers and practitioners". Kolb's theory utilises a measuring instrument known as the Learning Style Inventory, a nine item self-description questionnaire (e.g. from Version 3[1] (1999): When I learn I like to (a) deal with my feelings; (b) watch and listen; (c) think about ideas; (d) be doing things). The self-assessment questionnaire aims at recognising four types of learner: diverger (concrete/ reflective); converger (abstract/ active); assimilator (abstract/ reflective); accomodator (concrete/ active). Riding (2000), however,

criticises the LSI for focussing on behaviour related to learning styles rather than the style features themselves.

Leite, et al. (2010) attempted to validate a further learning styles inventory instrument, the VARK, which measures perceptual preferences (visual, aural, read/write and kinaesthetic) and found preliminary support for test scoring while acknowledging that the contexts used in the questionnaire sometimes lacked focus. Many other learning style instruments have been developed including the Perceptual Learning Style Preference Questionnaire (PLSPQ) (Reid, 1984) which divides learning style into group and individual (social styles) and visual, auditory, tactile and kinaesthetic (perceptual learning modalities). DeCapua and Wintergerst (2005: 3) acknowledge that the PLSPQ is the only learning style instrument to have "been normed on non-native speakers of English, with reliability and validity established on high intermediate or advanced ESL classes". On the other hand, Wintergerst, DeCapua and Verna (2003: 89) criticised the PLSPQ on several points including "statement design problems and a lack of reliability and validity". Wintergerst, DeCapua and Itzen (2001: 398) suggest that the wording of items in the PLSPQ may confuse non-native speakers of English. In order to clarify learner responses to questionnaires, DeCapua and Wintergerst (2005: 7) suggest the use of semi-structured interviews allows "the researcher to ask more complex and involved questions". In contrast, DeCapua and Wintergerst (2005) believe that unstructured interviews are too broad and imprecise and structured interviews too restrictive and uninformative.

In a critical review of learning styles and the commercialisation of assessment instruments that measure them, Pashler, McDaniel, Rohrer and Bjork (2009) found no evidence to suggest an interaction between learning style and a matching mode of instruction. However, Pashler, et al. (2009: 105) acknowledged that "it would be an error to conclude that all possible

versions of learning style have been tested and found wanting; many have simply not been tested at all". Pashler, et al. (2009: 108) also concede "that learning-style questionnaires have at least some psychometric reliability" and that "there is little doubt" that specific aptitudes or skills such as high auditory or visual ability exist (2009: 110).

While researchers debate the learning style versus cognitive style arguments, many classroom practitioners within the L2 field will be more familiar, however, with the sensory perception definitions of learning style (visual; auditory; kinaesthetic/tactile) and as Oxford, Ehrman and Lavine (1991: 7) wrote: "every teacher has probably heard students describe a preference for seeing or hearing material".

2.2 Sensory preference

As with the discussion over learning style and cognitive style, consensus is also far removed on the question of which sensory preference style is dominant. In this section, the various instruments that have been designed to measure sensory preference styles are introduced and learning strategies related to sensory preference type are identified.

2.2.1 Instruments for measuring sensory preference

Previous research (Oxford, 1995b) has indicated that many individuals have one modality of preference through which they respond to input most successfully, and that for the majority of individuals (50% to 80%) it is visual. This figure, though, is in stark contrast to those contained in Reid's influential 1987 study which found that, in general, "ESL students strongly preferred kinesthetic and tactile learning styles" (Reid, 1987: 92). Reid's study was

extensive, involving 1,388 native and non-native speakers studying at universities in the United States. The ESL participants originated from various countries across Asia, the Middle East and Europe, their length of stay varied from under 3 months to over 3 years, their ages ranged from under 18 to over 50 and their language proficiency ranged from TOEFL scores of under 350 to over 575. In addition, the participants' fields of vocation were diverse.

Reid, whose PLSPQ (1987) has been extensively used as a means of identifying learning style, lists the modalities and learning preferences as: visual (reading and studying charts); auditory (listening to lectures and audiotapes); kinaesthetic (experiential learning – total physical involvement with a learning situation); tactile (building models or doing laboratory experiments); group; individual. Using Reid's PLSPQ (1987), Peacock (2001) found that the most popular sensory preference styles were kinaesthetic and auditory (the participants were students at a Hong Kong university) and Rossi-Le (1995), surveying adult L2 immigrants in the United States, found kinaesthetic and tactile to be the preferred styles. Although his findings were not dissimilar to those of Reid, Peacock (2001: 6) criticises the PLSPQ for being vague by using statements such as "doing something in class" and "work with others" and for not giving "concrete examples of activities for each style". Notwithstanding those concerns, Peacock (2001: 11) questioned 46 EFL teachers at a Hong Kong university and found that 96% agreed with Reid's hypothesis that "all students have their own learning styles and learning strengths and weaknesses".

A study by Tight (2010) looked to measure L2 vocabulary acquisition based on matching perceptual (sensory) learning style (visual, auditory, tactile/kinaesthetic and mixed) to individual preferences through the use of multiple modality instruction. The participants'

learning style preferences were assessed by way of the Learning Style Survey (LSS) constructed by Cohen, Oxford and Chi (2006). Tight (2010: 803) justified his selection of this particular survey questionnaire by referencing a study by Carson and Longhini (2006) that had been partially designed around the LSS, and by noting that the LSS has "evolved from an apparently valid and reliable learning styles instrument", the Style Analysis Survey (Oxford, 1995a). The study by Tight (2010) firstly found that 64% of the participants did have a preferred learning style and that the most common single preference was visual (38%), followed by auditory (16%) and tactile/kinaesthetic (9%). Vocabulary learning was tested through both active recall and active recognition, and the results showed that mixed-modality instruction was the most effective for that group of participants (eight classes of third-semester learners of L2 Spanish at a U.S. university).

A further instrument for measuring learning style, the VARK Learning Styles Inventory, categorises visual, aural, read/write and kinaesthetic. A study by Leite, et al. (2010), using the VARK questionnaire, found that those with a single preference accounted for less than a third (29.7%) of the participants, while Lincoln and Rademacher (2006) found in a study of 69 ESL students that only 17% preferred a mixed modality (with 25% choosing kinaesthetic compared to 4% for visual). A large-scale (901 participants) study by Dobson (2009) using the VARK questionnaire found rather different ratios. In Dobson's study, conducted among Physiology undergraduates, nearly half were identified as visual (females 46% and males 49%) and those identified as kinaesthetic amounted to 4 per cent for women and 5 per cent for men. The discrepancies between Dobson's (2009) study (which involved native speakers) and Lincoln and Rademacher's (2006) (which involved ESL students) may possibly be due to the former group being better able to understand the questions than those in the latter.

The reasons for the differences in the study findings between those using Reid's PLSPQ (predominantly kinaesthetic), those using the Learning Style Survey of Cohen, Oxford and Chi[2] (predominantly visual) and those using VARK (predominantly mixed or kinaesthetic) may be due to the wording of the questionnaires, or perhaps to cultural or social factors. For example, the VARK questionnaire uses language which, according to Leite, et al. (2010: 335) "is occasionally difficult to interpret", and scenarios which are only appropriate to "a subsection of the population" (Leite, et al., 2010: 336). Wintergerst, et al. (2001: 398) have concerns over the wording of the PLSPQ which could result in "poor measures of six learning styles".

Although many practitioners (e.g., Oxford, Ehrman and Lavine, 1991) believe that students utilise and benefit from different sensory preferences, it appears there is not, as yet, an instrument sufficiently proven to measure those preferences. Tight (2010: 816) is of the same opinion, claiming: "Continued efforts at standardization among these instruments are needed in order to make results across studies more comparable". Furthermore, sensory preferences are but one of a range of learning style variables so diverse that it is unlikely that a diagnostic tool can be constructed to enable a reliable evaluation of all such learning styles.

2.2.2 Learning strategies by sensory preference type

Oxford (1996) referencing Oxford, et al. (1991) believes visual learners use strategies including reading alone, watching movies and interacting with screens – all of which should be aided by the use of captions with video. Lincoln and Rademacher (2006: 487) identify those with an aural style as learning "best by listening to stories, lecture, or audiotapes" and those with a kinaesthetic style as preferring practical information and being physically

mobile. Some researchers (e.g. Lincoln and Rademacher, 2006; Tight, 2010) define kinaesthetic and tactile style separately, while others combine the two (e.g. Leaver, Ehrman and Shekhtman, 2005 who use the term motor learning). It should also be noted that many learners may not have a single sensory preference but rather a mixture of preferred modalities, and may therefore benefit from a variety of input methods.

A study by Shen (2010) investigated the effects of perceptual learning style preferences on L2 lexical inferencing and whether explicit instruction benefitted particular perceptual learning styles. Shen's study used the PLSPQ to identify preferences and the participants were 145 university students in Taiwan learning English as a foreign language. The study revealed that although the auditory learners achieved a higher mean gain than the others between pre-test and post-test, overall the "findings did not reveal clear-cut differences in performance between learners with different learning style preferences" (Shen, 2010: 545). Shen (2010: 546) concludes though that teachers "need to be aware of the students' learning style preferences". Interestingly, Ehrman, et al. (2003: 318), while noting their findings of mixed results among the literature researching L2 learning strategy instruction, consider the main reason "might be that the students' diversity of learning styles and needs was not systematically taken into account in the presentation of strategy instruction". In the study by Peacock (2001: 1), interviews with the participants (206 students at a Hong Kong university) revealed that 72% "were frustrated by a mismatch between teaching and learning styles".

An additional point to note is that learners not only benefit from being able to draw on more than one preference (albeit many have a particular one they favour), but that within an individual sensory modality, learners may also draw upon two forms of mental representation – verbal and non-verbal (Mayer and Sims, 1994). This is illustrated by words being

visualised as images, and objects being represented as words; while both systems of information processing can operate independently, representations in one "can activate those in the other" (Al-Seghayer, 2001: 206). The Dual Coding Theory (Paivio, 1986) posited that a combination of verbal and non-verbal information improves information processing and more recently the use of multimedia has been advocated as a means of providing both types of input (Sydorenko, 2010). Overall, researchers in the field of sensory preference type agree that while learners have differing learning preferences they tend to favour, it is common for them to also utilise other modalities and thus may benefit from a variety of input methods.

2.3 Aiding listening skills through the use of captions

The use of captions to aid the development of listening skills is a further topic of much debate, with some considering captions to be a distraction and others seeing captions as a valuable support tool. While Sydorenko (2010: 64)[3] believes that videos should be used without captions if the goal is to improve listening, others (Chung, 1999; Markham, 2001) believe that captioning augments comprehension. Alternatively, Leveridge and Yang (2013: 200) highlight in their study that many less advanced learners "were answering the questions before the audio track had finished", thereby indicating an over-reliance on captions and supporting findings by Pujolá (2002). On the other hand, Leveridge and Yang (2013: 200) also claim that learners who typically struggle in listening tests "find the added support of captions in multimedia lessons to be a great advantage", as they connect the text with the soundtrack. Leveridge and Yang (2013: 202) also warn however that "captions may be distracting for higher-level learners who have previously created L2 listening schemas", a key top-down listening strategy (e.g. Cook, 1997).

The development of a learner's listening skills is partly dependent on the learner's existing vocabulary knowledge. Nagy (1997) is clear though that having seen a word before does not equate to knowledge of the word; Laufer (1997: 142) goes further, stating that knowing a word implies "familiarity with all its features". Dale (in Read, 2000: 27) adds that such thorough knowledge would include the ability to distinguish the word from others that are similar in meaning or form. Studies to determine the size and depth of a lexical base sufficient to provide for adequate comprehension have, according to Van Zeeland and Schmitt (2013), been limited to just two (Bonk, 2000; Stæhr, 2009). Montereo Perez concurs (2014: 119), noting that "only a handful of researchers have investigated the relationship between listening comprehension and vocabulary learning". Bonk's study, however, can be criticised for using a dictation test to measure word knowledge, for "a level of subjectivity in the marking" of listening comprehension (Van Zeeland and Schmitt, 2013: 460) and for the construction of an either/or comprehension rating system (good or inferior). Stæhr's study, however, found a strong correlation between vocabulary size and depth and listening comprehension, albeit with only an estimated lexical coverage measure. The absence of an accepted measure of lexical coverage is a clear gap in the literature surrounding listening comprehension.

Without an empirically derived percentage for lexical coverage, comparisons with the coverage for reading comprehension have tended to be used. Research into the relationship between lexical coverage and reading comprehension has indicated that a coverage figure of between 95% (e.g., Laufer, 1989) and 98% (e.g., Hu and Nation, 2000) is needed to attain an adequate text comprehension; defining 'adequate', however, is another issue. A lexical coverage figure of 98% equates to a lexical base of 8,000-9,000 word families (Nation, 2006) and one of 95% to 4,000-5,000 (Laufer and Ravenhorst-Kalovski, 2010).

Comparing vocabulary knowledge for L2 reading and listening comprehension, however, is not comparing like for like. There are fundamental differences in the way listening texts are processed compared to written texts. For example, the employment of top-down processing skills is often relied upon by listeners to compensate for a limited vocabulary and difficulty in decoding continuous speech (Field, 2004; Vandergrift, 2011). Additionally, the benefit to the reader of being able to refer back to the text in order to decode the meaning is one that is not available to the listener who also has to contend with the various features of connected speech such as reduction, assimilation, elision, resyllabification and cliticization which can blur word boundaries (Field, 2003) and lead to inefficient parsing (Goh, 2000).

In contrast to the difficulties of comprehending spoken input, listeners can enjoy the benefit of prosodic features such as sentence stress and intonation, (Van Zeeland and Schmitt, 2013) as an aid to comprehension. However, some learners may need help with decoding the intonation patterns of everyday connected speech, and Cauldwell and Hewings (1996) advocate the use of authentic recordings to help build familiarisation. As a further tool to help develop listening skills, Bird and Williams (2002) found that captions may allow the listener to recognise word boundaries through being able to visualise the stream of connected speech which would then act as an aid toward improved parsing. Winke, et al. (2010: 65) agree, stating that "captioning helps identify word boundaries", thereby helping "learners segment what might otherwise be an incomprehensible stream of speech". Vanderplank (1988: 277) noted that being able to visually confirm what was being heard was motivational and a way of reducing anxiety. The caveat, though, is that in order to benefit from this aspect, captions need to be transcribed accurately in order to avoid responses from learners such as: "The difficulty for me was when the spoken and written words did not match" (Stewart and Pertusa, 2004: 441).

While watching video, viewers also benefit from interpreting body language and other visual clues and, as Adolphs and Schmitt (2003: 433) note, "spoken discourse uses a smaller variety of word types than written discourse", suggesting that a lower lexical coverage might apply to listening comprehension compared to reading comprehension. A study of words used in a variety of television programmes (Webb and Rodgers, 2009) revealed that knowing the most frequent 2,000-4,000 word families corresponded to a lexical coverage of 95%, a much lower vocabulary base than in the reading comprehension studies. The Webb and Rodgers (2009) study was limited to transcripts from eight American television programmes of different genres and further studies are needed to confirm that a lower lexical coverage applies to television viewing than to a comparable written text. The question of lexical coverage is also further complicated when captions are added to the equation resulting in a viewer receiving input through three different modalities (visual images, written text and spoken text).

An important factor to consider when receiving multiple forms of input is the relationship between long-term and working memory, and whether too much simultaneous input results in cognitive overload. Diao, Chandler and Sweller (2007: 239) advise that "having to process multiple forms of the same information imposes an extraneous cognitive load that interferes with learning", resulting in what is termed 'the redundancy effect'. Mayer and Moreno (2003: 49) claim that the redundancy effect may occur "when a multimedia presentation consists of simultaneous animation, narration and on-screen text". According to Mayer and Moreno (2003: 49), when animation is removed cognitive load is reduced and redundancy eliminated, whereas a combination of narration and on-screen text achieves greater comprehension than a narration-only presentation. Importantly, Diao, et al. (2007: 240) note though that these redundancy studies involved native English speakers (who I believe are unlikely therefore to need the additional support of captions) and that within the ESL/ EFL

fields the use "of materials in multiple modalities and modes including text, sound, and video for users to process is a popular trend". Sydorenko (2010: 52) questions the redundancy principle's application to second language learners' listening comprehension (and vocabulary acquisition) believing the opposite to be true (i.e. that the benefits from three modes of presentation outweigh those from two modes). Winke, et al. (2013: 257) also refute the suggestion "that learners may detrimentally divide their visual attention between images and captions" seeing such claims as "simplifications" that lack "precise empirical evidence". In summary, further research into the redundancy effect on L2 learners is needed before it can be shown that multiple forms of input is beneficial to second language learners' listening development.

A further area of the literature that has a bearing on comprehension is that surrounding the topic of form-meaning mapping, the psycholinguistic process of associating meaning with the spoken or written representation of previously unknown grammar or lexis. Winke, et al. (2010: 65), referencing Garza (1991), believe that captioning "helps language learners connect auditory to visual input" and this "may aid form-meaning mapping, an essential process for foreign language acquisition". Winke, et al. (2010: 80) also draw attention to the relevance of Schmidt's noticing hypothesis (1990): "awareness (through attention) is necessary for noticing, which in turn is essential for learning". The point Winke, et al. (2010) make is that the learner needs to be involved actively in order to facilitate learning, and that if the language input is too complex then the learner may need some help (i.e. in the context of watching a video, the captions can provide that support).

In summary, there is much debate over the benefits L2 learners gain from the use of captions to aid listening comprehension. Researchers have found differing advantages and

disadvantages at different proficiency levels and there is a significant gap in the literature regarding the amount of lexical coverage required to facilitate listening comprehension. While the benefits of parsing have been attributed to the use of captions (Bird and Williams, 2002), other research expresses concerns about the effects of multiple modality input on working memory. The research into cognitive overload is particularly contentious, however, as studies into redundancy have been conducted with native speakers rather than L2 learners.

2.4 Vocabulary acquisition through listening with captions

Although it has been argued that captions aid listening comprehension in a foreign or second language (Garza, 1991; Markham, 2001), the benefit on vocabulary acquisition is not so clear cut. This area of the literature is somewhat problematic. Studies that have been conducted are difficult to compare (Sydorenko, 2010: 52) because, firstly, the participants have been of different ages and different levels of proficiency and, secondly, the focus has been on vocabulary recognition rather than recall; recognising form is a different skill from recalling form (Nation, 2001) and requires less cognitive processing. Laufer, Elder, Hill and Congdon (2004) suggest the following as a suitable measure for vocabulary acquisition: active recall (ability to supply the L2 word); passive recall (ability to demonstrate understanding of the L2 word); active recognition (ability to select the L2 word from four options); passive recognition (ability to choose the meaning of the L2 word from four options). Results from testing learners' ability to acquire vocabulary would be more robust if the measures proposed by Laufer, et al. (2004) were employed, rather than simply testing for vocabulary recognition.

Additionally, when testing for vocabulary learning, research has assumed performance would be better if the modality of testing matches the modality of input (Sydorenko, 2010); with

three modes of input (visual images, written text and spoken text) it may prove difficult to identify the input that the learners attended to and whether their focus of attention shifted from one to another during the input. Learners' attentional capacity may also vary at different levels of proficiency and, although Markham (1999) found that advanced learners performed better on an aural word recognition test that compared captioned to non-captioned videos, this may not be the case for less proficient learners. Taylor (2005) goes further, believing captions to be more of a hindrance than a help to lower-level learners. Markham (1999: 327) also questioned whether the participants used "their considerable reading ability to augment their less developed listening skills". Stewart and Pertusa (2004: 440) found that although vocabulary recognition tests were somewhat inconclusive, viewing with captions was an overwhelmingly positive experience with over 75% of the (intermediate) participants agreeing or strongly agreeing to the statement: "I learned some new vocabulary because I was able to both hear the words and see them written". Such qualitative feedback should perhaps carry more weight in the debate over whether captions are beneficial or detrimental in the acquisition of vocabulary through listening.

2.5 Further studies on the use of captions

When using captioned video, learners have to contend with three types of input – text, imagery and sound – with the inherent danger that this may result in cognitive overload as the limits of working memory are tested (Sydorenko, 2010). According to Sydorenko (2010: 53), only two studies (Vanderplank, 1988; Taylor, 2005) have investigated the modalities L2 learners pay attention to when watching a video with captions. Vanderplank's study (1988)[4] found that Arabic learners benefitted less from captions than their European counterparts; he concluded that European students are more familiar with captions and therefore better able to

utilise them. Sydorenko (2010), however, suggests that if a learner's own orthographic script is very different from the L2 in the captions, the benefit from captions is likely to be reduced and this may be seen as a more reasoned argument.

A further difficulty associated with the use of captions includes the speed of the dialogues or commentary, resulting in insufficient time to read and listen concurrently. Danan (1992), writing on (contemporary) television industry standards, informs that subtitles are not verbatim as constraints of time, space and image have to be considered. As such, according to those standards, subtitles can have a maximum character length of between 30 to 34 characters per line over two lines with a maximum duration of 6 seconds. Therefore, some researchers (Garza, 1991) have suggested simplifying captions but, according to Montero Perez, et al. (2014: 118-119) "research that has attempted to reduce the textual density by offering only keyword captions has yielded inconclusive results". Reducing the textual density is also at odds with the benefits to be gained from accurate transcriptions that aid listening comprehension through facilitating speech decoding and segmentation. While lower level learners may well benefit from a simplification of the spoken text, this could prove demoralising for more advanced learners who would be looking to reconcile what they heard with what was actually said.

Leveridge and Yang (2013: 202) state that "relatively little is known regarding *how* learners process the captioning support or *what* learners are attending to when they look at captions". One could also question *when* exactly learners are focussing on captions during the course of a video; as Winke, et al. (2013: 257) highlight, attention may be paid to particular captions which may help learners "parse words and decode meaning" but not to others. Winke, et al. (2013: 256) note that several studies (e.g. Sydorenko, 2010; Taylor, 2005; Vanderplank,

1988) have researched the question of how learners cope with "simultaneous intake of audio, video and text" by way of interviews, and have found that "learners might not be able to explain clearly how they process the three kinds of input". Whether or not the positive effects of using captions with video outweigh the negative will be very much dependent on the individual and their own particular strengths and weaknesses. Leveridge and Yang (2013: 200) noted that the more advanced learners tended "to ignore the on-screen captions, judging the text as interference", whereas those less advanced relied "on the captions quite heavily".

In the study by Sydorenko (2010: 59), the participants struggled to read the captions while they were on screen; however, the participants were at a beginner level and the videos were authentic clips from a Russian comedy series which also contained a much lower percentage of known words than the minimum of 95% stated in the literature. In addition, as Sydorenko (2010: 65) highlights, the learners had been given little exposure to similar media prior to the research and "might not have developed strategies for dealing with different types of input simultaneously". It is perhaps not surprising that the combination of an input level graded far too high and unfamiliar cultural references resulted in difficulties in attaching meaning to the new vocabulary.

In order to investigate the attention learners pay to captions, Winke, et al. (2013) conducted an eye-tracking study. The data constitutes quantitative evidence and shows that the foreign language learners in the study "fixated on the captions area 68% of the time that the captions were on screen", regardless of whether the video contained familiar content or not (Winke, et al., 2013: 262). Follow-up qualitative interviews were not particularly enlightening though as learners struggled "to report on their use of captions in anything but very broad terms, as past research has shown" (Winke, et al., 2013: 264). In summary, the study concluded that

captions are a valuable tool, facilitate comprehension, aid parsing and help learners understand ambiguous input, but that reading captions may prove taxing due to difficulties in processing two types of visual input simultaneously.

Winke, et al. (2010) also researched whether including the captions on a first or a second listening was more beneficial and found that it made little difference in performance of a written vocabulary or comprehension test, but that the learners who saw the captions on the first viewing performed significantly better on an aural vocabulary test. The study also confirmed research (Ellis, 2003: 77) that captions help learners parse speech streams into manageable chunks which convey meaning. Winke, et al. (2010: 81) concluded "that captions are beneficial because they result in greater depth of processing by focusing attention, reinforce the acquisition of vocabulary through multiple modalities, and allow learners to determine meaning through the unpacking of language chunks". Vanderplank (1988: 280) views captioning as a "mediating device", acting as a textual support to the listener, rather than a listening substitute, while Bird and Williams (2002) demonstrated that the use of captions does not have an adverse effect on auditory processing. Overall, studies have attested to captions being beneficial for second language learners for both listening comprehension and vocabulary learning although the advantages for lower levels are very different from those for higher levels.

2.6 Research questions

This study investigates the relationship between a learner's sensory preference style and the benefit gained from the use of captioned video in terms of listening comprehension and vocabulary acquisition. The research questions therefore are:

1. Does captioning relate to the extent to which L2 learners comprehend authentic videos?

2. Does captioning relate to the extent to which L2 learners recall vocabulary items from watching authentic videos?

3. Does captioning relate to the extent to which L2 learners recognise vocabulary items from watching authentic videos?

4. Does sensory preference style relate to the extent to which L2 learners comprehend authentic videos with captions?

5. Does sensory preference style relate to the extent to which L2 learners recall vocabulary items from watching authentic videos with captions?

6. Does sensory preference style relate to the extent to which L2 learners recognise vocabulary items from watching authentic videos with captions?

3.   METHODOLOGY

This chapter is divided into seven sections. Firstly, details of the participants' background are provided, and this is followed by sections explaining the materials used in the study and details of the instruments used for the testing. The fourth section describes the procedure, and this is followed by examples of the groups' treatment. The sixth section explains the scoring used in the testing and the final section describes the data analysis.

3.1 Participants

The participants were 50 EFL students studying at a U.K. language college. As the students had been rigorously level tested by the college where the study took place, it can be assumed

that their L2 level is fairly uniform. The nationalities of the participants were diverse, with

representation from Europe, the Middle East and the Far East. Ages ranged from mid-

twenties to mid-thirties, and of the 50 participants 26 were female and 24 male. The

participants were more or less evenly distributed across the C (with captions) and NC

(without captions) groups, providing a fairly balanced composition. The study took place

over the duration of a month and each session lasted for approximately 70 minutes.

3.2 Materials

This section details the listening materials and the key words in the videos selected for

testing.

3.2.1 Listening materials

The two captioned videos used in this study were approximately 5 minute long clips from

original full-length documentaries and focused on various scientific phenomena such as space

research or why the world is round. The first video clip, 'Why is the Earth round' lasts 5'35''

(776 words), focuses on the gravitational effects on planets, specifically the Earth; the second

clip, 'Explosive planet' (5'02'' and 549 words) highlights the unusual features of one of

Jupiter's moons, Io. The narrator was the same in both videos, to allow for uniformity, and

each video clip was transcribed and captions were then added to the original video, using

specialist software[5], thus ensuring accurate captioning and avoiding the inaccurate transcripts

found on authentic video (DVDs, television broadcasts, etc.). This also enabled the use in the

study of identical video content for both viewings, the only difference being the addition of

captions for the second viewing. By using accurate captions the benefit to learners in terms

of parsing, being able to separate the words boundaries in streams of connected speech, should be enhanced. Accurate transcriptions also mean the inclusion of a certain amount of redundancy (repetition, false starts, incomplete utterances, re-phrasings, self-corrections, etc.) and other aspects of an auditory nature (pauses and variations in pitch, volume and tone). All of these features can distract so being able to visualise the language used (through the captions) alongside the images, which provide context, may benefit the listener.

3.2.2 Key word selection

The British National Corpus[6] was accessed to check the frequency per million words of the key words and the distracters in the two videos. As can be seen in Table 1, the analysis of key words and distracters in Video 1 contained some surprises. For example 'dust' was more commonly used than 'viewed'; even in noun form alone there were 21.65 examples of 'dust' per million. Also surprising was the low number of examples for 'delivers' and the high number for 'core'. It must be borne in mind though that the British National Corpus reflects native speaker usage and it may be unlikely that L2 learners would be more familiar with the nouns 'dust' and 'core' in comparison to the verbs 'viewed' and 'delivers'. In addition, the infinitive form of deliver returned only 21.36 examples. The figure of 220.5 for 'kind' is for the noun form rather than the adjective; the verb form of mould showed only 0.43 examples.

Table 1 Why the Earth is round

Key words   **Distracters**

spherical	**1.81**	certainly	**184**
overwhelmingly	**1.81**	viewed	**21.26**
dust	**26.88**	kind	**220.5**
symmetrical	**3.35**	delivers	**3.45**
mould	**10.19**	beach	**37.83**
core	**34.2**	average	**99.92**

Although the analysis of key words and distracters in Video 2 was less surprising, it was noticeable that the adverb 'periodically' was less frequent than the verb 'stretching'. However, participants will be unlikely to associate stretching and squashing in the context of planet formation and in this context 'stretching' should prove challenging as a key word. As 'periodically' showed such a low number of examples of use it was decided to replace it with a different distracter. Having checked the frequency of use of pull as a noun (2.21), gravitational (56.99) and neighbouring (13.71), influence (105.01) was eventually chosen.

Table 2 Explosive planet

Key words   **Distracters**

orbiting	**0.75**	massive	**43.76**
stretching	**11.98**	periodically	**4.03**
squashing	**0.46**	powerful	**71.83**
contort	**0.11**	surface	**90.25**
molten	**2.58**	unique	**43.74**
shattering	**2.62**	eventually	**90.02**

Checking the frequency of the key words was an important consideration as the rationale for selection was to choose words that would very likely be unfamiliar to the participants. Of the key words in the first clip, two are adjectives, two are nouns, one is a verb and one is an adverb. In the second clip, the key words are made up of four present participles, one verb and one adjective. The key words were chosen because of their importance in the text for providing both context and meaning.

3.3 Instruments

The instruments employed in this study consist of: a questionnaire survey to determine sensory preference style; active recall and active recognition tests for key words in the videos; a test of prior knowledge to check participants' knowledge of the key words prior to watching the videos; comprehension tests on the video content.

3.3.1 The questionnaire survey

The questionnaire used in this study, the Sensory Preference Survey (SPS), is a slight modification of Part 1 ('How I Use My Physical Senses') of the 'Learning Style Survey' questionnaire developed by Cohen, Oxford and Chi (2006) which itself is a refined version[7] of the Style Analysis Survey designed by Oxford (1995a). The questionnaire measures the sensory preference types (expressed in the Survey as physical senses) of visual, auditory and kinaesthetic. To complete the questionnaire, learners grade their responses to 30 behavioural statements on a five-point Likert scale (0 = never; 1 = rarely; 2 = sometimes; 3 = often; 4 = always) (see Appendix B for the full instrument used in the study). The responses are therefore a self-assessment of how often the participants behave according to the statements,

and the survey is designed to be completed in approximately 5 minutes with participants reminded not to spend too long on each answer. One benefit of this approach is the avoidance of participant fatigue due to an overly taxing task. The LSS questionnaire has been used effectively in other studies (e.g., Carson and Longhini, 2006; Tight, 2010) and was chosen ahead of other survey formats because of its focus on the three modalities (visual, auditory and tactile/ kinaesthetic) rather than extending the focus to include group or individual preferences (e.g. PLSPQ) or read/write (e.g. VARK) . Listening is an individual activity, so a focus on group preferences would be redundant as would a focus on reading or writing.

The item sequence in the LSS questionnaire can be questioned; as Dörnyei (2007: 111) advises, "items from different scales need to be mixed up as much as possible to create a sense of variety and to prevent respondents from simply repeating previous answers". As a consequence, it was decided to adjust the sequencing of the questions in the SPS in order to avoid this pitfall and the 30 questions were therefore selected at random. In addition, the wording in the SPS statements was generally kept the same as in the LSS despite some difficult phrasing (e.g. manipulating, rather, doodles, pacing, etc.) as the level of students in this study is B2 and so they may be expected to be able to follow the questions; if the test were repeated with a lower level this may well be an issue. The expression 'my tapping feet' was, however, changed to 'tapping my feet' as the former was considered to be a typing error. In addition, after trialling the questionnaire, 'manipulating' was subsequently altered to 'moving and handling'. Despite some reservations concerning the SPS, the decision to include it in the study reflects Dörnyei's (2007: 104) advice that the use of a questionnaire is "particularly suited for quantitative, statistical analysis". The temptation to include any open-ended items of a qualitative nature was also avoided, thereby heeding Dörnyei's (2007: 105)

warning that the respondents are likely to have "a somewhat superficial and relatively brief engagement with the topic".

3.3.2 Vocabulary tests

According to Laufer, et al. (2004: 205) "a good vocabulary test should measure the extent to which people can correctly associate word form with the concept the form denotes". Using Laufer, et al.'s (2004: 206-207) hierarchy (from most difficult to least difficult, with the final pair being of equal difficulty), the form-meaning link for assessing an understanding of vocabulary is:

i.   Active recall – being able to produce the L2 form for a given meaning (the question supplies the first letter of the target word to prevent a non-target word being used):

    a. Turn into water *m*_____

ii.   Passive recall – being able to produce the meaning of the L2 form:

    a. When something *melts it turns into* _____.

iii. Active recognition – being able to select the target word from four options:

    a. *Turn into water* a. elect b. blame c. melt d. threaten

iv.   Passive recognition – being able to select the meaning of target word from four options:

    a. *Melt* a. choose b. accuse c. make threats d. turn into water

Wesche and Paribakht (in Read, 2000: 77) criticise multiple-choice vocabulary items for the following reasons:

a) Being difficult to construct and requiring much field-testing.

b) Testing the learner on the meaning of a word that perhaps they know through a different meaning.

c) Having a 25 per cent chance of being correct.

d) Perhaps testing knowledge of distracters rather than the target words.

e) Learners perhaps missing a word due to either a lack of knowledge of words or a lack of understanding of syntax in the distracters.

f) Testing only a limited sample of the learner's total vocabulary.

As Read (2000: 90) highlights, one limitation of vocabulary tests is "they can give only a superficial indication of how well any particular word is known". Of Laufer, et al.'s (2004) four assessment means, active recall is much more difficult than the others and so was used to test vocabulary understanding alongside active recall; care was taken to avoid one assessment test informing the other. Reflecting the subject matter, many of the key words in the texts could be categorised using Read's (2000) terminology as 'specialised' (e.g. mould) or 'subtechnical' (e.g. contort). The vocabulary tests were conducted in written rather than spoken form as the focus of the study is on how learners benefit from captioning, and although the students would have heard the words aurally, the captions would have provided a visual representation.

3.3.3 Tests of prior knowledge of target vocabulary

The students were tested on their prior knowledge of the key vocabulary in order to identify any words they were already familiar with. The following scale was used: 1 = ***I definitely didn't know*** this word before watching the video; 2 = I think there is ***a good possibility I didn't know*** this word before watching the video; 3 = I am ***not sure if I knew*** this word

before watching the video; 4 = I think there is ***a good possibility I knew*** this word before

watching the video; 5 = ***I definitely knew*** this word before watching the video. To prevent

students focusing on the key words during the listening, the prior knowledge test was given

after the vocabulary test but before the comprehension test; this procedure follows that used

by Al-Seghayer (2001), Bird and Williams (2002), Danan (1992) and Winke, at al. (2010). If

a participant noted that a key word was known to them prior to the video, this word was

excluded from the findings.

3.3.4 Listening comprehension tests

For both of the video clips a comprehension test was devised which is an adaptation of a

format used by Montero Perez, et al. (2014: 124) and inspired by Buck's (2001: 114) default

listening construct. Buck's (2001) construct measures the listener's ability to: "process

extended samples of realistic spoken language, automatically and in real time"; "understand

the linguistic information that is unequivocally included in the text"; "make whatever

inferences are unambiguously implicated by the content of the passage."

Collectively the tests included 18 items: 6 short-answer questions; 6 true/false options; 6

multiple-choice items. Once the 18 questions were written I endeavoured to increase

reliability by trialling the tests on non-participating students at a similar level (B2) and

comparing their scoring to the scores they achieved in Cambridge First Certificate listening

tests. Care was taken to avoid ambiguous questions and unclear instructions, and other

marking schemes (e.g., Montero Perez, et al., 2014) were studied as ways of ensuring higher

reliability in test design and validity in scoring.

Buck (2001: 138-139) sees short answer questions as "particularly suitable for testing the understanding of clearly stated information". Short answer questions are also open-ended (Alderson, Clapham and Wall, 1995: 57) with the candidates needing to "think up the answers for themselves". Ensuring the learners are aware of what is expected of them is paramount (Alderson, et al., 1995: 58-59), and pre-testing items can ensure that they have clarity. As Hughes (2003: 166) writes, the "technique can work well, provided that the question is short and straightforward, and the correct, preferably unique, response is obvious".

Buck (2001: 147) notes that some question the suitability of true/false questions "for testing listening because listeners normally focus on what is said, not on what is not said". Buck (2001: 147) also warns that many test-takers randomly guess answers correctly (there is after all a 50% possibility of being right), but also acknowledges that the guesses are often "based on some degree of partial comprehension".

When writing the multiple-choice the advice of Buck (2001: 146) to avoid the following was taken into consideration: distracters that most participants are unlikely to choose; ambiguity; answers that could be provided from the participant's background knowledge. Alderson, et al. (1995: 47) also warn against writing answers that could be challenged, as well as answers that may have more than one correct response. According to Alderson, et al. (1995: 49), answers that look too much like dictionary definitions should also be avoided. Also of import was Hughes (2003:165) recommendation that multiple choice alternatives designed to test listening "must be kept short and simple".

One key consideration was whether to provide the questions before or after the listening. As Buck (2001: 137) highlights, listening in the real-world is normally done for a purpose, so to ask participants to listen "with no specified purpose" is "very unnatural". However, Buck (2001: 137) has conducted studies into this and found that while test-takers felt the preview of questions "aided comprehension", "it did not make a significant difference to item difficulty". Taking these findings into account, it was decided to provide the questions after the viewings, primarily because the participants would already be contending with three types of input (text, imagery and sound), and the distraction of a question sheet in front of them may have resulted in cognitive overload. Finally any key words in the comprehension test sections were kept to a minimum.

3.4 Procedure

Firstly, participants completed a questionnaire survey in order to establish their sensory preference type; participants responded to 30 behavioural statements on a five-point Likert scale and quantitative data of their sensory preference type was collected. The questionnaire surveys were conducted in classrooms in the same sessions as the subsequent video viewings and vocabulary and comprehension tests.

For the next stage, participants (C group) watched two five minute video clips, the first viewing of the clips without captions, the second viewing with captions; the control group (NC group) watched both times without captions.

Following the viewing of the first video, the participants were tested on the key words in the text (alongside distracters) through both active recall and active recognition (in Laufer, et

al.'s (2004) form-meaning hierarchy active recall is the most taxing test for learners). Next, the participants' previous knowledge of the key vocabulary in the clip was elicited so as to identify any familiar words. A five-point rating scale was used ranging from 'I definitely didn't know this word before watching the video' to 'I definitely knew this word before watching the video'. The reason the test was given after rather than before the listening was to prevent students from focusing on the key words during the listening; another option would have been to increase the number of distracters contained in a pre-test of prior knowledge of the key words. However, as the key words are quite specific to the text, and as the distracters should be easier to answer, it would be difficult to present the key words to the participants without expecting an ensuing effect on their listening comprehension.

Finally, after being tested on vocabulary, participants took a comprehension test which included 3 short answer questions, 3 true/false options and 3 multiple choice items. The same procedure for the C group (viewing without captions; viewing with captions; vocabulary tests of key words; elicitation of prior knowledge of key words; listening comprehension test) was followed for the next video clip. Likewise, the NC group followed the same procedure for the second video as per the first video (viewing without captions; second viewing without captions; vocabulary tests of key words; elicitation of prior knowledge of key words; listening comprehension test).

3.5 Treatment

The participants were divided into two groups, one viewing with captions and the other without. Participants in the C group watched two 5 minute video clips, the first time without captions and the second time with captions while the NC group watched the clips twice, both

times without captions. The decision to employ captions on the second viewing for the C

group rather than the first viewing reflects a study by Winke, et al. (2010). In the study

(Winke, et al., 2010: 76), two groups of learners either watched videos with captions on the

first or the second viewing; the results found that "the effect of order was not significant for

the written vocabulary or comprehension test". However, interview data from the two groups

tended to favour captions with the second viewing. Winke, et al. (2010: 79) noted that

"captions seemed to help isolate what the learners perceived to be important and helped them

determine what to pay attention to in subsequent viewings".

The vocabulary and comprehension tests were carried out after each individual set of clips in

order to reduce the strain on memory recall. In order to measure comprehension, a

combination of tests (short answer questions, true/false options and multiple choice items)

was employed. Both groups received the same tests.

Post-testing, participants from group C were encouraged to provide feedback on their

impressions and experiences of the use of captions when watching authentic video.

3.6 Scoring

In this section the scoring procedure for the Sensory Preference Survey questionnaire, the

vocabulary tests and the comprehension tests are explained.

3.6.1 Learning style assessment

The Sensory Preference Survey questionnaire was marked by adding together the points the participants had chosen to arrive at their sensory preference type. The individual responses to the 30 questions were also recorded and Pearson correlation analyses were carried out against the three modalities (visual; auditory; kinaesthetic).

3.6.2 Vocabulary tests

The vocabulary tests were marked and graded by myself, awarding 2 points for a correct answer, 1 point for showing an awareness of the correct answer (e.g. using the infinitive rather than the participle form) and 0 points for an incorrect answer. For example, participant 1 received the following points for active recall from Video 1: Q2, sphere (instead of spherical), 1 point; Q5, dust, 2 points; Q8 melt (instead of mould), 0 points. According to Melka (1997), in many studies the marking of receptive tests is quite lenient, so in this study care was taken to avoid such criticism. For the vocabulary active recall and active recognition tests, any word that the participant had indicated prior knowledge of was excluded. The potential maximum number of points for vocabulary therefore was 12 for each of the active recall and recognition tests for both videos, giving an overall maximum of 48 per video. If a participant indicated prior knowledge of 2 or more of the 6 key words the participant was treated as an outlier and excluded from that part of the data analysis; this meant that for the first video vocabulary testing 5 participants from the C Group and 2 participants from the NC group were excluded, and for the second video vocabulary testing 1 participant from each group was excluded.

3.6.3 Comprehension tests

The comprehension tests were marked and graded by myself, awarding 2 points for a correct answer, 1 point for showing an awareness of the correct answer and 0 points for an incorrect answer. For example, participant 9 received the following points for active recall from Video 1: Q3 (h), heat (instead of heat and sound), 1 point; Q3 (g), a sphere, 2 points; Q3 (i) no answer provided, 0 points. The comprehension tests, a combination of 3 short-answer questions, 3 true/false options and 3 multiple-choice items for each video allowed for a maximum score of 18 points per video.

3.7 Statistical Analysis

All of the data from this study was entered into SPSS version 22 to enable analysis. To address research questions 1 – 3, independent samples t-tests were conducted, with captioning being the independent variable and the dependent variables being listening comprehension, vocabulary recall and vocabulary recognition. The alpha level for all testing was set at $p < .05$.

To address research questions 4 – 6, Pearson correlations were computed between the scores obtained for the three sensory styles (visual, auditory and kinaesthetic) and various test performances (listening comprehension, vocabulary recall and vocabulary recognition) for the C and NC groups separately. Coefficients of .25 were considered as small, .40 as medium and .60 as large (Plonsky and Oswald, 2014).

To test the validity of the SPS questionnaire, internal consistency reliability statistics were computed using Cronbach's Alpha. Cronbach's Alpha for the whole questionnaire was found to be .598. The alpha coefficients for items tapping the various sensory types were lower (visual .422; auditory .516; kinaesthetic .409). A re-run of the analysis for the visual questions was carried out excluding Q3 ('I use colour coding to help me as I learn or work'); this particular question had confused some participants and by removing it from the analysis the reliability increased to .47. Similarly, auditory Q7 (I prefer to learn by listening to a lecture rather than reading) was shown to be not functioning as intended (-.106) and when excluded Cronbach's Alpha increased to .555. Following the adjustments to the data, a *t*-test was conducted to identify the means and SDs of the sensory preference type scores derived from the SPS questionnaire.

4. RESULTS

4.1 Research Questions 1-3: The effects of captioning

Research questions 1-3 asked: (1) Does captioning relate to the extent to which L2 learners comprehend authentic videos?; (2) Does captioning relate to the extent to which L2 learners recall vocabulary items from watching authentic videos?; (3) Does captioning relate to the extent to which L2 learners recognise vocabulary items from watching authentic videos?

The results indicated that captions benefited L2 learners in terms of listening comprehension and both vocabulary recognition and recall. Many participants fared better on comprehension than the vocabulary tests (particularly on active recall). Table 3 shows the results for the

effects of captioning on listening comprehension, vocabulary recall and vocabulary recognition.

In response to research question (1), Table 3 shows the mean scores of both groups for listening comprehension (Video 1: C (*N*=25) *M* = 65.08, NC (*N*=25) *M* = 58.42; Video 2: C (*N*=25) *M* = 48.42, NC (*N*=25) *M* = 36.80). The results show that the C group outperformed in both tests, and that the difference between the two groups was greater for the more difficult test (video 2).

As expected, based on Laufer, et al.'s (2004) form-meaning hierarchy, participants found active recall of vocabulary particularly challenging and the results can be seen as evidence to support the hierarchy. Table 3 also shows the mean scores of both groups for vocabulary recall (Video 1: C (*N*=20) *M* = 13.75, NC (*N*=23) *M* = 9.2; Video 2: C (*N*=24) *M* = 20.35, NC (*N*=24) *M* = 9.68). The data relating to research question (2) shows that the C group also performed better in terms of vocabulary recall but that participants found the second test to be the more difficult

The results shown in Table 3 also allow research question (3) to be answered. The table shows the mean scores of both groups (Video 1: C (*N*=20) *M* = 63.33, NC (*N*=23) *M* = 43.55; Video 2: C (*N*=24) *M* = 74.93, NC (*N*=24) *M* = 60.62). Once again, the C group outperformed the NC group in vocabulary recognition in relation to both videos. Similar to the vocabulary recall tests, the participants found the second vocabulary recognition test to be the more difficult of the two.

In sum, the results provide evidence that the use of captions when watching authentic videos is beneficial to L2 learners in all three measures (listening comprehension, vocabulary recall and vocabulary recognition).

Table 3 Group Statistics

Test	Group	N	M	SD
Vocabulary Recall Video 1	C	20	13.7500	17.28904
	NC	23	9.2000	14.39470
Vocabulary Recognition Video 1	C	20	63.3350	20.94857
	NC	23	43.5522	29.08097
Comprehension Video 1	C	25	65.0840	16.78078
	NC	25	58.4240	19.63781
Vocabulary Recall Video 2	C	24	20.3500	19.77557
	NC	24	9.6833	11.74152
Vocabulary Recognition Video 2	C	24	74.9333	16.19688
	NC	24	60.6250	27.83411
Comprehension Video 2	C	25	48.4200	17.89583
	NC	25	36.8028	22.05978

Table 4 shows the results of conducting Levene's test of equality of variance. Independent samples t-tests found that there was a significant effect difference between the C and NC groups for comprehension: Video 1, $t(1,48) = 1.289$, $p=.204$; Video 2, $t(1,48) = 2.045$, $p=.046$.

Independent samples t-tests also found that there was a significant effect difference between the C and NC groups for vocabulary recall: Video 1, t(1,41) = .942, p=.352; Video 2, t(1,46) = 2.272, p=.028.

Furthermore, independent samples t-tests found that there was a significant effect difference between the C and NC groups for vocabulary recognition: Video 1, t(1,41) = 2.524, p=.016; Video 2, t(1,46) = 2.177, p=.035.

Table 4 Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Recall_1	Equal variances assumed	.201	.657	.942	41	.352
	Equal variances not assumed			.930	37.151	.359
Recognition_1	Equal variances assumed	2.636	.112	2.524	41	.016
	Equal variances not assumed			2.582	39.715	.014
Comp_1	Equal variances assumed	.309	.581	1.289	48	.204
	Equal variances not assumed			1.289	46.860	.204
Recall_2	Equal variances assumed	4.703	.035	2.272	46	.028
	Equal variances not assumed			2.272	37.424	.029
Recognition_2	Equal variances assumed	7.299	.010	2.177	46	.035
	Equal variances not assumed			2.177	36.974	.036
Comp_2	Equal variances assumed	.795	.377	2.045	48	.046
	Equal variances not assumed			2.045	46.043	.047

4.2 Sensory preference type

Table 5 shows the mean scores of both groups for each sensory type based on participants' cumulative responses to the SPS questionnaire (Visual: C (N=25) M = 57.04, NC (N=25) M = 55.75; Auditory: C (N=25) M = 46.94, NC (N=25) M = 46.66; Kinaesthetic: C (N=25) M = 43.02, NC (N=25) M = 45.44). The results show that visual was the dominant sensory preference overall, followed by auditory and then kinaesthetic. The results also show that both C and NC groups followed the same pattern in terms of sensory preference.

Table 5 Sensory Preference Type

	Group	N	Mean	Std. Deviation
Visual	C	25	57.0400	9.14075
	NC	25	55.7560	9.84505
Auditory	C	25	46.9480	10.62376
	NC	25	46.6640	11.13635
Kinaesthetic	C	25	43.0200	9.76042
	NC	25	45.4480	10.71195

4.3 Research Questions 4-6: The effects of sensory preference type

Research questions 4-6 asked: (4) Does sensory preference style relate to the extent to which L2 learners comprehend authentic videos with captions?; (5) Does sensory preference style relate to the extent to which L2 learners recall vocabulary items from watching authentic videos with captions?; (6) Does sensory preference style relate to the extent to which L2 learners recognise vocabulary items from watching authentic videos with captions?

Pearson correlation analyses were conducted in order to ascertain whether sensory preference style relates the extent to which L2 learners comprehend video with captions. As can be seen in Table 6, the results produced significant negative Pearson correlations for the C group, relating to auditory learners, of -.545 for Video 1 and -.410 for Video 2.   The results, in response to research question (4), show that captions benefit non-auditory rather than auditory learners in terms of listening comprehension.

In response to research question (5), Table 6 also shows a significant negative correlation for the C group of -.426 in vocabulary recall in video 2. This suggests that captions benefit non-auditory rather than auditory learners in terms of vocabulary recall.

Table 6 Correlations (Captions Group, Auditory)

Group			Auditory
C	Auditory	Pearson Correlation	1
		Sig. (2-tailed)	
		N	25
	Recall_1	Pearson Correlation	-.173
		Sig. (2-tailed)	.466
		N	20
	Recognition_1	Pearson Correlation	.046
		Sig. (2-tailed)	.846
		N	20
	Comp_1	Pearson Correlation	-.545**
		Sig. (2-tailed)	.005
		N	25
	Recall_2	Pearson Correlation	-.426*
		Sig. (2-tailed)	.038
		N	24
	Recognition_2	Pearson Correlation	-.289
		Sig. (2-tailed)	.170
		N	24
	Comp_2	Pearson Correlation	-.410*
		Sig. (2-tailed)	.042
		N	25

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

In answer to research question (6), Table 7 shows a correlation for the NC group of -.409 for

recognition of vocabulary in video 2 (i.e., suggesting that participants with a visual

preference, viewing with captions, are better able to recognise vocabulary than those viewing without captions).

Table 7 Correlations (No Captions Group, Visual)

Group			Visual
NC	Visual	Pearson Correlation	1
		Sig. (2-tailed)	
		N	25
	Recall_1	Pearson Correlation	-.005
		Sig. (2-tailed)	.983
		N	23
	Recognition_1	Pearson Correlation	-.056
		Sig. (2-tailed)	.800
		N	23
	Comp_1	Pearson Correlation	-.123
		Sig. (2-tailed)	.559
		N	25
	Recall_2	Pearson Correlation	.019
		Sig. (2-tailed)	.930
		N	24
	Recognition_2	Pearson Correlation	-.409[*]
		Sig. (2-tailed)	.047
		N	24
	Comp_2	Pearson Correlation	-.139
		Sig. (2-tailed)	.506
		N	25

* Correlation is significant at the .05 level (2-tailed).

While no structured interviews were conducted, feedback from participants was helpful. For example, participant 13 said that he preferred the test format and video content to "the IELTS listening practice" he is used to doing. Participant 11 noted that although the subject matter was not her "usual interest" she found the videos "very interesting". Participant 2 felt she may have performed better in the testing had it not been "on a Friday afternoon" (at the end of a long week). Participant 12 found the process "very helpful". Several participants commented on the wording of the SPS questionnaire, finding references to colour coding confusing and feeling that some of the questions needed to be made clearer regarding the context and setting ("do they mean in the classroom?"). It should also be noted that direct comparison with other studies on learning styles is dependent on the use of a questionnaire containing similar categories in those studies.

5. DISCUSSION

This study set out to explore the benefit of using authentic video with captions, and in particular the extent that captions helped learners with different sensory perception styles. The study was able to ascertain that the participants benefited from the use of captioning in terms of listening comprehension, vocabulary recall and vocabulary recognition (research questions 1-3). The study was also able to show that learners' sensory preference type moderates the relationship of captioning to listening comprehension and vocabulary acquisition (research questions 4-6).

The results of this study can be compared with previous research. With regard to research question (1), the findings contradict those of Montero Perez, et al. (2014), but support earlier research (e.g. , Chung, 1999; Markham, 2001; Winke, et al., 2010), which had found that the

use of captions provided support to the participants in terms of aiding listening comprehension.

One possible explanation for the difference between this study and that of Montero Perez, et al. (2014: 133) could be that in the earlier study the clips might have been "too easy for the participants", whereas in this study Table 3 (in Chapter 4) shows that although the caption group outperformed, both groups found the comprehension tasks challenging. Indeed, the results show that for the more difficult test (video 2) the difference between the two groups was greater (C (*N*=25) *M* = 48.42, NC (*N*=25) *M* = 36.80) than for the less difficult test (video 1: C (*N*=25) *M* = 65.08, NC (*N*=25) *M* = 58.42). Winke, et al. (2010: 79), referencing Dörnyei (2005), speculate that captioned video allows learners to access the content through more than one modality. For this level of learners (B2), the benefit of captions may outweigh the possibility of cognitive overload and the use of captions can be viewed as a positive contribution to aiding listening comprehension.

Research questions (2) and (3) relate to the benefits of captioning on active vocabulary recall and recognition. Winke, et al. (2013: 266) note the benefits of parsing, in allowing participants to "understand novel words", is in part due to the role played by captions when they accompany spoken text and visual images. In support of this, the results from this study show that participants who were provided with captions significantly outperformed those who were not (see Table 3 in Chapter 4). These results are reflective of previous research (Danan, 1992; Sydorenko, 2010; Winke, et al., 2010), which showed beneficial effects from captions on recall, but less so compared to Montero Perez, et al. (2014) who found that the caption group performed no differently from the non-caption group. However, in terms of vocabulary recognition, the study results reflect those of Montero Perez, et al. (2014), whereby those viewing with captions recognised the target words more successfully than

those who did not have captions. One interpretation may be that the captions helped to provide context. Winke, et al. (2010: 79) had found that "captioned rather than noncaptioned videos aid novel vocabulary recognition" and the results from this study supports those claims (Video 1: C (*N*=20) *M* = 63.33, NC (*N*=23) *M* = 43.55; Video 2: C (*N*=24) *M* = 74.93, NC (*N*=24) *M* = 60.62). Another possibility is that noticing (e.g., Schmidt, 1990) may play a part as participants are primed through the first viewing (Winke, et al., 2010) for confirmation to arrive via the second, captioned, viewing; the unknown word has become salient because it was hitherto unknown. The results also offer confirmation that in Laufer, et al.'s (2004) form-meaning hierarchy, active recall is the most taxing test for learners. Test results from this study are also consistent with the suggestion from Nagy (1997: 82) that within "the limitations of context" a focus on comprehension may be "a more attainable goal" than a focus on "word learning" as participants from both groups scored higher in comprehension tests than in vocabulary tests.

Within the confines of the SPS questionnaire (see Section 3.3.1) the study found that there was a significant negative relationship between auditory preference and listening comprehension in the C group (auditory correlations of -.545 for Video 1 and -.410 for Video 2); this finding could be expressed more simply as 'the use of captions benefits visual (or kinaesthetic) learners more than auditory learners in terms of listening comprehension' (in response to research question 4). Similarly, regarding research question 5, it appears that the use of captions benefits visual (or kinaesthetic) learners more than auditory learners in terms of vocabulary recall (correlation of -.426 in vocabulary recall in video 2 for the C group, auditory). The results are compatible with research (Oxford, 1996) into learning strategies for learners with a visual preference, who are likely to focus more on the captions than those with an auditory preference. It is difficult, though, to conclude that this benefit may be the

same for learners with a kinaesthetic preference, who tend to prefer more physical tasks according to previous research (Lincoln and Rademacher, 2006).

With regard to research question 6, by omitting visual Q3 ('I use colour coding to help me as I learn or work') which had confused some participants and which had been highlighted in Cronbach's Alpha testing as possibly unreliable, a significant correlation result was found in the NC group (-.409) in relation to Video 2 (i.e., visual style participants viewing with captions are better able to recognise vocabulary than those of the same preference style viewing without captions). This result evidences the benefit of captions for learners with a visual preference. As this seems to be the first study that compares sensory preference with the use of captions, it is not possible to compare data with other studies. However, the study does confirm research into sensory preference styles in terms of learning strategies (Lincoln and Rademacher, 2006; Oxford, 1996; Tight, 2010) with visual learners expected to benefit more from the written captions and auditory learners more from the audio soundtrack.

Data from the SPS questionnaire broadly supported previous research from Tight (2010) in that the dominant sensory preference was visual (see Table 5, Chapter 4). This contradicts findings from Reid's study (1987: 92) which had found that, in general, "ESL students strongly preferred kinesthetic and tactile learning styles". In the present study there was not a single student who could be seen as predominantly kinaesthetic. A plausible explanation for the differences in the findings may be that the wording of the various sensory preference questionnaires can, at times, be unclear or confusing to the participants.

6. LIMITATIONS

The study findings are limited in a number of ways. Firstly, the participants were at a B2

level and so the results cannot be generalized to learners at a different level of proficiency.

Within a B2 level it should also be borne in mind that some participants will be better than

others at listening. Furthermore, a larger sample size would be preferable. The videos

themselves were of a scientific nature and while interesting for many of the participants, may

have been uninteresting or too taxing for others. Additionally, the target vocabulary reflected

the themes of the video and therefore the key words may not be reflective of the participants'

wider vocabulary awareness.

The wording of the Sensory Preference Survey questionnaire could be challenged; Dörnyei

(2007: 103) cautions that "minor differences in how a question is formulated and framed can

often produce different levels of agreement and disagreement". It should also be noted that

discouraging respondents from spending too much time thinking about their selections could

result in responses that may not be replicated in future testing. DeCapua, et al. (2005: 9) raise

concerns that this approach can lead to participants tending to "just get it done" rather than

consider their responses more carefully. DeCapua, et al. (2005: 7) also highlight the

importance of context in such questionnaires, finding that different contexts would result in

different selections by participants. In this present study, feedback from participants also

showed some confusion over what was being asked of them in the questionnaire (e.g. as to

the question of colour coding). It may also be preferable for questions in the survey to be

more reflective of a classroom setting, with prompts such as 'I think better when I move

around (e.g., pacing or tapping my feet)' being replaced with, for example, 'I enjoy mingling

activities (e.g., when we get out of our seats and ask each other questions)'. Long (2005: 38)

highlights pitfalls such as "double-barreled questions" (e.g. "Do you read and write letters to your customers in English?"); the survey could thus be criticised for using phrasing such as "I prefer to learn by listening to a lecture rather than reading". Another potential limitation could be the cultural effect of using the adverb *never* in the Likert scale. DeCapua, et al. (2005: 10) found that students from Asia were often not comfortable in using *never* in their responses due to its negative connotations; similarly, the use of *always* was often avoided as it was seen by some as too strong a response. DeCapua, et al. (2005) also discovered that some Asian participants would prefer the use of *hardly ever* to *rarely* because of greater familiarity with its use.

According to Vandergrift and Tafaghodtari (2010), learners develop L2 listening skills through performing tasks in the classroom, thereby engaging in metacognitive processes which lead to automatization over time; as the college where the participants were tested uses a continuous enrolment system, newer students may be disadvantaged in this respect. In addition, the use of captions may act as a crutch to students, resulting in learners prioritising reading over listening and thereby lessening the benefit gained from the use of acquired listening skills.

The absence of interviews as a supplement to the comprehension test may be seen as a limitation. Dörnyei (2007) notes the usefulness of various ways of conducting interviews: single or multiple sessions; structured, unstructured or semi-structured. DeCapua, et al. (2005: 7) found semi-structured interviews to be "a rich source of data". I am also mindful of the advice proffered by Ellis (2004) concerning the limitations of a solely quantitative approach. Ellis (2004) suggests instead a mixed method approach, which would facilitate triangulated data collection. On the other hand, Nunan (1992) warns of the possibility of

participants trying to meet the perceived needs of the interviewer through their responses. In addition, Block (2000: 758) concedes that he might view interview data "as *representational* of real events or *presentational* of the individuals speaking". Also, previous research in the field of mixed modality input has shown that learners are only able to speak in general terms about the benefit of captions (Winke, et al., 2013: 264), a danger also identified by DeCapua, et al. (2005: 12). Winke, et al. (2013: 270) also note that "language learners are often conflicted when asked holistic questions concerning whether captions are beneficial". Wintergerst, et al. (2001: 389) found that their data analysis from their questionnaire (Reid's PLSPQ) contradicted their oral interviews "on several occasions". Taking the experiences of Winke, et al. (2013), DeCapua, et al. (2005) and Wintergerst, et al. (2001) into consideration it was decided not to conduct formal interviews but rather encourage students to comment on their experiences, post-testing, on the videos, the procedures and how they felt about captioning.

Similarly, the use of a free-recall task was also considered. As suggested by Overstreet (2002) (in Lee, 2007: 95), free recall allows the researcher to check the participants' ability to recall information from the text by permitting the participants to "recall anything and everything they can without any researcher bias created by test questions". However, while a free-recall task can certainly achieve this, it may also be criticised for testing memory constraints rather than comprehension and for being difficult to administer in terms of marking which could be seen as subjective rather than standardised.

In common with other studies into the benefits of captions, the lack of empirically sound research into vocabulary thresholds for listening attainment is a limitation. Reliance on research into vocabulary acquisition and comprehension through studies into L2 reading

skills is not a sufficient failsafe – as Van Zeeland and Schmitt (2013: 458) note, "vocabulary plays a different role in the two modalities". In addition, in this study the test of prior word knowledge suffers from employing the participant's judgement not only as to whether the word had been known before watching the video but also in the definition of 'knowing' a word. Many of the participants signaled that they 'definitely knew' words that they had failed to answer correctly in both active recall and active recognition. The study might also be seen as more robust were it to include testing of passive recall and passive recognition, thereby completing Laufer, et al.'s (2004) form-meaning hierarchy. Furthermore, given the diverse nationalities of the participants it is possible that some of the key words may be cognates in their language, thereby favouring those participants. In addition, as assumptions regarding the lexical coverage required for successful listening comprehension are based on studies into reading comprehension, a further limitation is that the participants' reading skills were not tested.

Nagy (1997) writes of the importance of context in constructing meaning for new vocabulary; the specific contexts provided by the videos could lead to questions over the participants' awareness of new vocabulary outside that context. As the context in the videos is so explicit one could question whether the use of the key words in other contexts would also lead to recognition of those words, especially given L2 learners might "have a greater need to use context" (Nagy, 1997: 76).

Melka (1997: 95) also notes "that context greatly aids comprehension". The comprehension tests for this study were designed around Buck's (2001: 114) default listening construct which measures the listener's ability to: "process extended samples of realistic spoken language, automatically and in real time; understand the linguistic information that is

unequivocally included in the text; make whatever inferences are unambiguously implicated by the content of the passage." The test was trialled with non-participants and it was determined that, although difficult, was suitable to participants at a B2 level. Notwithstanding these efforts, it should also be noted that both the vocabulary and comprehension test constructs have not been empirically validated.

The participants in this study ranged from those in their twenties to those in their thirties and were a mixture of male and female. Whether similar results would be attained from testing younger or older participants is not known, so the question of age of participant can be seen as a further limitation. Finally, as noted through feedback from participants, the time of the test may also play a part in the performance of the participant.

7. CONCLUSION

The use of captions when watching authentic video has been shown to be of benefit to the participants in this study in terms of listening comprehension, vocabulary recall and vocabulary recognition. Furthermore, evidence has been found to suggest that learners with different sensory preference styles benefit to different degrees from the use of captions with authentic video.

The results from this study support earlier work (Montero Perez, et al., 2014; Winke, et al., 2013) that had suggested captions are valuable to L2 learners. Analyses showed that the group viewing with captions outperformed the group viewing without captions on all three measures (listening comprehension, active vocabulary recall and active vocabulary recognition).

A further intent of this study was to investigate the benefit captions provided to learners with different sensory preference styles. Analyses indicated that captions benefit visual (or kinaesthetic) learners more than auditory learners in terms of listening comprehension. Likewise, the use of captions benefits visual (or kinaesthetic) learners more than auditory learners in terms of vocabulary recall. In addition, learners with a visual style, when viewing with captions, outperform those of the same preference style, viewing without captions, in terms of vocabulary recognition.

This study highlights many gaps in the literature and draws attention to important implications for future research. For example, McCarthy and Carter (1997) argued the case for further research into the differences between written and spoken vocabulary; yet two decades later researchers are still struggling to determine the lexical coverage required to facilitate listening comprehension, and continue to rely on data extracted from studies on reading comprehension. Future research should endeavour to clarify the differences between successful reading and listening comprehension based on empirically derived figures for lexical coverage.

Previous studies that engaged in defining sensory preference have often produced conflicting findings so, therefore, further studies are warranted. The construction of a universally accepted questionnaire, that can be empirically tested to produce consistent data, would be a major step forward in this area of research into individual differences. In addition to developing a questionnaire that identifies sensory preference style more effectively, researchers could also look at ways of raising learner awareness of their own style and how to harness that awareness to facilitate learning.

The use of captions has been shown to benefit learners, but future research could identify what learners pay attention to when captions accompany audio and visual images. Further studies are also needed to validate the relationships between the benefits from captioning and the effects of those benefits on different sensory preference types. Studies into the use of captions with full-length television programmes have been conducted (Webb and Rodgers, 2009), but it would be interesting to expand on these and to explore the relationship with sensory preference type. In addition, the benefit of longer term exposure to captions could be investigated through a longitudinal study measuring the effect on sensory preference type.

The focus on an individual's learning style preference may have a number of pedagogical implications. The construction of a reliable, user-friendly survey questionnaire would enable classroom practitioners to respond to the diversity in the classroom and construct timetables and activities aimed at limiting any mismatch between learning style and language task (e.g. the use of captions would help visual learners to parse chunks of language). An added awareness of the learners' different sensory preference styles would also help the teacher provide material that would be complementary to more than one sensory mode. From the learner's perspective, an understanding of their individual strengths could help them gain more control over their learning, both inside and outside the classroom.

The use of authentic video in the classroom enables the teacher to match topic content to specific learner interests and to introduce themes which are of current interest. Combining authentic video with captions should also be encouraged as "it might facilitate students' recognition of unknown words and their making initial form-meaning connections" (Montero Perez, et al., 2014: 135). By helping learners recognise new vocabulary, the use of captions can contribute to language acquisition. Furthermore, the use of captions can also help to

reinforce vocabulary which has been presented previously. I would also suggest that the use of authentic video in the classroom may encourage learners to watch similar content outside the classroom, thereby helping to foster learner autonomy.

---

[1] Version 3 available online: http://learningfromexperience.com/tools/kolb-learning-style-inventory-lsi/

[2] Or derivatives of their Learning Style Survey.

[3] It should be noted that in the study by Sydorenko (2010) the participants were beginners and the video content was both authentic and of the comedy genre so it was perhaps optimistic to expect significant improvements in listening.

[4] It should also be noted that Vanderplank's study used BBC CEEFAX English language subtitles; whether these captions, which were originally intended to help the deaf and hard of hearing, were accurate transcripts is a moot point. I have found that television subtitles are inaccurate transcripts and, aside from including errors in transcription, tend to avoid natural features of authentic speech such as fillers, hesitation, repetition and other redundancies as well as simplifying grammar when the meaning is clear. In an example of a recent broadcast, Breakfast (on BBC 1, 27/06/14, from 6 a.m.) contained 222 inaccuracies over a randomly selected 5 minutes (an average of 44.4 per minute). Interestingly, the film The Godfather (Paramount, 1972), when shown on Film 4, contained 104 inaccuracies in the opening 10 minutes of dialogue; this compares with 89 on the DVD version and, furthermore, nearly all of the caption inaccuracies relating to the two versions are different. Vanderplank (2013: 5)

also noted "issues with the quality of captions which were, at times, poor and inaccurate. The captioning of feature films, in particular, was often careless about the accuracy of language".

[5] Final Cut Pro 6.

[6] Concordance examples taken from The British National Corpus (BNC), a 100 million word collection of written and spoken samples generated from a wide variety of sources representing current British English usage: http://bncweb.lancs.ac.uk/ . Accessed on 17/05/2015.

[7] 2 questions were made easier to read: 'I understand lectures better when professors write on the board' was changed to 'I understand lecturers better when they write on the board'; 'I prefer to start doing things rather than checking the directions first' was changed to 'I'd rather get started than pay attention to the directions'.

<u>References</u>

Adolphs, S. and Schmitt, N. (2003) 'Lexical Coverage of Spoken Discourse' *Applied Psycholinguistics*, 24/4, 425-438.

Alderson, J.C., Clapham, C. and Wall, D. (1995) *Language Test Construction and Evaluation*. Cambridge: Cambridge University Press.

Al-Seghayer, K. (2001) 'The Effect of Multimedia Annotation Modes on L2 Vocabulary Acquisition: A Comparative Study' *Language Learning and Technology*, 5/1, 202-232.

Bird, S.A. and Williams, J.N. (2002) 'The Effect of Bimodal Input on Implicit and Explicit Memory: An Investigation into the Benefits of Within-Language Subtitling' *Applied Psycholinguistics*, 23/4, 509-533.

Block, D. (2000) 'Problematizing Interview Data: Voices in the Mind's Machine?' *TESOL Quarterly*, 34/4, 757-763.

Bonk, W.J. (2000) 'Second Language Lexical Knowledge and Listening Comprehension' *International Journal of Listening*, 14/1, 14-31.

Buck, G. (2001) *Assessing Listening*. Cambridge: Cambridge University Press.

Carson, J.G. and Longhini, A. (1996) 'Focusing on Learning Styles and Strategies: A Diary Study in an Immersion Setting' *Language Learning*, 52/2, 401-438.

Cauldwell, R. and Hewings, M. (1996) 'Intonation Rules in ELT Textbooks' *ELT Journal*, 50/4, 327-334.

Chung, J.-M. (1999) 'The Effects of Using Video Texts Supported with Advance Organizers and Captions on Chinese College Students' Listening Comprehension: An Empirical Study' *Foreign Language Annals*, 32/3, 295-308.

Cohen, A.D., Oxford, R.L. and Chi, J.C. (2006) *Learning Style Survey: Assessing Your Learning Styles.* In Cohen, A.D and Weaver, S.J. (Eds) *Styles- and Strategies-Based Instruction: A Teachers Guide*. Minneapolis: Center for Advanced Research on Language Acquisition, University of Minnesota, pp.15-21. Online. Available at https://fdde40f2-a-551982af-s-sites.googlegroups.com/a/umn.edu/andrewdcohen/docments/2002-Cohen%2COxford%2C%26ChiLearningStyleSurvey.pdf?attachauth=ANoY7cqohFMf-7V3os0hhJH1lbfOj23Cu4zv_DcZIQJCXub5MlHqzixlP-XwOn3zSkyQLEEPxK7u0k_vdGMCEu06hNIY_q7i4S_dE-QNA_Q6UGbzU1RJ7Pip1wi-PNxZCDXE8EDZg1h3AuxPHMXNk9VautRVE_4LkFroAUwHME1P8ncWiRzXUDeYO4l rNJBdP_KgV8BJv3g3E4rUDYuBnzjWQKyci_0_oirqHiZXfs9Rti16DxlqmQDABCOBzHZa kuIWFld8micVaLyo5G2ccvIrDw_RauHZYQ%3D%3Dandattredirects=0 (accessed 1 May 2015).

Cohen, A.D., Oxford, R.L. and Chi, J.C. "Learning Style Survey: Assessing Your Own Learning Styles" (n.d.). Online. Available at http://www.carla.umn.edu/maxsa/documents/LearningStyleSurvey_MAXSA_IG.pdf (accessed 08 May 2015)

Cook, G. (1997) 'Key Concepts in ELT: Schemas' *ELT Journal* 51/1, 86.

Danan, M. (1992) 'Reversed Subtitling and Dual Coding Theory: New Directions for Foreign Language Instruction' *Language Learning* 42/4, 497-527.

DeCapua, A. and Wintergerst, A.C. (2005) 'Assessing and Validating a Learning Styles Instrument' *System*, 33, 1-16.

Diao,Y., Chandler, P. and Sweller, J. (2007) 'The Effect of Written Text on Comprehension of Spoken English as a Foreign Language' *American Journal of Psychology*, 120/2, 237-261.

Dobson, J.L. (2009) 'Learning Style Preferences and course Performance in an Undergraduate Physiology Class' *Advances in Physiology Education* 33, 308-314.

Dörnyei, Z. (2005) *The Psychology of the Language Learner: Individual Differences in Second Language Acquisition*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.

Dörnyei, Z. (2007) *Research Methods in Applied Linguistics*. Oxford: Oxford University Press.

Ehrman, M.E., Leaver, B.L. and Oxford, R.L. (2003) 'A Brief Overview of Individual Differences in Second Language Learning' *System*, 31/3, 313-330.

Ellis, N.C. (2003) "Constructions, Chunking and Connectionism: The Emergence of Second Language Structure". In Doughty, C.J. and Long, M.H. (Eds) *The Handbook of Second Language Acquisition*. Malden, MA: Blackwell, pp.63-103.

Ellis, R. (2004) "Individual Differences in Second Language Learning". In Davies, A. and Elder, C. (Eds) *The Handbook of Applied Linguistics*. Malden, MA: Blackwell, pp.525-551.

"Explosive Planet - Wonders of the Solar System" (n.d.). BBC Two. Online. Available at https://www.youtube.com/watch?v=rAejrPirGxI (accessed 9 January 2015)

Field, J. (2003) 'Promoting Perception: Lexical Segmentation in L2 Listening' *ELT Journal*, 57/4, 325-334.

Field, J. (2004) 'An Insight into Listeners' Problems: Too Much Bottom-up or Too Much Top-down?' *System*, 32/3, 363-377.

Garza, T.J. (1991) 'Evaluating the Use of Captioned Video Materials in Advanced Foreign Language Learning' *Foreign Language Annals*, 24/3, 239-258.

Goh, C.C.M. (2000) 'A Cognitive Perspective on Language Learners' Listening Comprehension Problems' *System*, 28/1, 55-75.

Graham, S. (2006) 'Listening Comprehension: The Learners' Perspective' *System*, 34/2, 165-182.

Grgurović, M. and Hegelheimer, V. (2007) 'Help Options and Multimedia Listening: Students' Use of Subtitles and the Transcript' *Language Learning and Technology*, 11/1, 45-66.

Hu, M. and Nation, P. (2000) 'Unknown Vocabulary Density and Reading Comprehension' *Reading in a Foreign Language*, 13/1, 403-430.

Hughes, A. (2003) *Testing for Language Teachers*. (2nd ed.) Cambridge: Cambridge University Press.

"Kolb Learning Style Inventory home page" (n.d.). Online. Available at http://learningfromexperience.com/tools/kolb-learning-style-inventory-lsi/ (accessed 29 October 2014)

Kolb, D.A. (1984) *Experiential Learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.

Kolb, D.A. (1984) *Learning Style Inventory, Version 3*. Boston: TRG Hay/McBer.

Laufer, B. (1989) *What Percentage of Lexis is Essential for Comprehension.* In Laurén, C. and Nordman, M. (Eds.) *Special Language: From Human Thinking to Thinking Machines*. Clevedon: Multilingual Matters, pp.316-323.

Laufer, B. (1997) *What's in a Word That Makes It Hard Or Easy: Some Intralexical Features That Affect the Learning of Words.* In Schmitt, N. and McCarthy, M.. (Eds) *Vocabulary: Description, Acquisition and Pedagogy*. Cambridge: Cambridge University Press, pp.140-155.

Laufer, B., Elder, C., Hill, K. and Congdon, P. (2004) 'Size and Strength: Do We Need Both to Measure Vocabulary?' *Language Testing*, 21/2, 202-226.

Laufer, B. and Ravenhorst-Kalovski, G.C. (2010) 'Lexical Threshold Revisited: Lexical Coverage, Learners' Vocabulary Size and Reading Comprehension' *Reading in a Foreign Language*, 22/1, 15-30.

Leaver, B.L., Ehrman, M. and Shekhtman, B. (2005) *Achieving Success in Second Language Acquisition*. Cambridge: Cambridge University Press.

Lee, S.-K. (2007) 'Effects of Textual Enhancement and Topic Familiarity on Korean EFL Students' Reading Comprehension and Learning of Passive Form' *Language Learning*, 57/1, 87-118.

Leite, W.L., Svinicki, M. and Shi, Y. (2010) 'Attempted Validation of the Scores of the VARK: Learning Styles Inventory with Multitrait-Multimethod Confirmatory Factor Analysis Models' *Educational and Psychological Measurement*, 70/2, 323-339.

Leveridge, A.N. and Yang, J.C. (2013) 'Testing Learner Reliance on Caption Supports in Second Language Listening Comprehension Multimedia Environments' *ReCALL*, 25/2, 199-214.

Lincoln, F. And Rademacher, B. (2006) 'Learning Styles of ESL Students in Community Colleges' *Community College Journal of Research and Practice*, 30, 485-500.

Long, M. (2005) *Methodological Issues in Learner Needs analysis.* In Long, M. (Ed.) *second Language Needs Analysis*. Cambridge: Cambridge University Press, pp.19-76.

Markham, P.L. (1999) 'Captioned Videotapes and Second-Language Listening Word Recognition' *Foreign Language Annals*, 32/3, 321-328.

Markham, P.L. (2001) 'The Influence of Culture-Specific Background Knowledge and Captions on Second Language Comprehension' *Journal of Educational Technology Systems*, 29/4, 331-343.

Mayer, R.E. and Moreno, R. (2003) 'Nine Ways to Reduce Cognitive Load in Multimedia Learning' *Educational Psychologist*, 38/1, 43-52.

Mayer, R.E. and Sims, V.K. (1994) 'For Whom Is a Picture Worth a Thousand Words? Extensions of a Dual-Coding Theory of Multimedia Learning' *Journal of Educational Psychology*, 86/3, 389-401.

McCarthy, M. and Carter, R. (1997) *Written and Spoken Vocabulary.* In Schmitt, N. and McCarthy, M.. (Eds) *Vocabulary: Description, Acquisition and Pedagogy*. Cambridge: Cambridge University Press, pp.20-39.

Melka, F. (1997) *Receptive Vs. Productive Aspects of Vocabulary.* In Schmitt, N. and McCarthy, M.. (Eds) *Vocabulary: Description, Acquisition and Pedagogy*. Cambridge: Cambridge University Press, pp.84-102.

Montero Perez, M., Peters, E., Clarebout, G. and Desmet, P. (2014) 'Effects of Captioning on Video Comprehension and Incidental Vocabulary Learning' *Language Learning and Technology*, 18/1, 118-141.

Nagy, W. (1997) *On the Role of Context in First- and Second-language Vocabulary Learning.* In Schmitt, N. and McCarthy, M.. (Eds) *Vocabulary: Description, Acquisition and Pedagogy*. Cambridge: Cambridge University Press, pp.64-83.

Nation, I.S.P. (2001) *Learning Vocabulary in Another Language*. Cambridge: Cambridge University Press.

Nation, I.S.P. (2006) 'How Large a Vocabulary Is Needed for Reading and Listening' *The Canadian Modern Language Review*, 63/1, 59-82.

Nation, I.S.P. and Webb, S. (2011) *Researching and Analyzing Vocabulary*. Boston: Heinle.

Nunan, D. (1992) *Research Methods in Language Learning*. Cambridge: Cambridge University Press.

Overstreet, M. (2002) *The Effects of Textual Enhancement on Second Language Learner Reading Comprehension and Form Recognition.* Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign.

Oxford, R.L. (1995a) *Style Analysis Survey.* In Reid, J.M. (Ed.) *Learning Styles in the ESL/EFL Classroom*. Boston: Heinle and Heinle, pp.208-215.

Oxford, R.L. (1995b) *Gender Differences in Language Learning Styles: What Do They Mean?.* In Reid, J.M. (Ed.) *Learning Styles in the ESL/EFL Classroom*. Boston: Heinle and Heinle, pp.34-46.

Oxford, R.L. (1996) 'Employing a Questionnaire to Assess the Use of Language Learning Strategies' *Applied Language Learning*, 7 (1-2), 25-45.

Oxford, R.L., Ehrman, M.E. and Lavine, R.Z. (1991) *Style Wars: Teacher-Student Style Conflicts in the Language Classroom.* In Magnan, S.S. (Ed.) *Challenges in the 1990s for College Foreign Language Programs. Issues in Language Program Direction: A Series of Annual Volumes*. Boston: Heinle and Heinle, pp.1-25.

Paivio, A. (1986) *Mental Representations: A Dual Coding Approach*. Oxford: Oxford University Press.

Pashler, H., McDaniel, M., Rohrer, D. and Bjork, R. (2009) 'Learning Styles Concepts and Evidence' *Psychological Science in the Public Interest*, 9/3, 105-119.

Peacock, M. (2001) 'Match or Mismatch? Learning Styles and Teaching Styles in EFL' *International Journal of Applied Linguistics*, 11/1, 1-20.

Plass, J.L. and Jones, L.C. (2005) *Multimedia Learning in Second Language Acquisition.* In Mayer, R.E. (Ed.) *The Cambridge Handbook of Multimedia Learning*. New York: Cambridge University Press, pp.467-488.

Plonsky, L. and Oswald, F.L. (2014) 'How Big Is "Big"? Interpreting Effect Sizes in L2 Research' *Language Learning*, 64/4, 878-912.

Pujolá, J.T.(2002) 'CALLing for help: Researching Language Learning Strategies Using Help Facilities in a Web-based Multimedia Program' *ReCALL*, 14/2, 235-262.

Read, J. (2000) *Assessing Vocabulary*. Cambridge: Cambridge University Press.

Reid, J.M. (1984) *Perceptual Learning Styles Preference Questionnaire*. Copyrighted.

Reid, J.M. (1987) 'The Learning Style Preferences of ESL Students' *TESOL Quarterly*, 21/1, 87-111.

Riding, R. (1991) *Cognitive Styles Analysis*. Birmingham: Learning and Training Technology.

Riding, R. (2000) *Cognitive Style: A strategic Approach for Advancement.* In Riding, R.J. and Rayner, S.G. (Eds.) *Interpersonal Perspectives on Individual Differences*. Stamford, CI: Ablex, pp.365-377.

Rossi-Le, L. (1995) *Learning Styles and Strategies in Adult Immigrant ESL Students.* In Reid, J.M. (Ed.) *Learning Styles in the ESL/EFL Classroom*. Boston: Heinle and Heinle, pp.118-125.

Schmidt, R. (1990) 'The Role of Consciousness in Second Language Learning' *Applied Linguistics*, 11/2, 129-158.

Shen, M.-y. (2010) 'Effects of Perceptual Learning Style Preferences on L2 Lexical Inferencing' *System*, 38/4, 539-547.

Stæhr, L.S. (2009) 'Vocabulary Knowledge and Advanced Listening Comprehension in English as a Foreign Language' *Studies in Second Language Acquisition*, 31/4, 577-607.

Stewart, M.A. and Pertusa, I. (2004) 'Gains to Language Learners from Viewing Target Language Close-captioned Films' *Foreign Language Annals*, 37/3, 438-442.

Sydorenko, T. (2010) 'Modality of Input and Vocabulary Acquisition' *Language Learning and Technology*, 14/2, 50-73.

Taylor, G. (2005) 'Perceived Processing Strategies of Students Watching Captioned Video' *Foreign Language Annals*, 38/3, 422-427.

Tight, D.G. (2010) 'Perceptual Learning Style Matching and L2 Vocabulary Acquisition' *Language Learning*, 60/4, 792-833.

Van Zeeland, H. and Schmitt, N. (2013) 'Lexical Coverage in L1 and L2 Listening Comprehension: The Same or Different from Reading Comprehension' *Applied Linguistics*, 34/4, 457-479.

Vandergrift, L. (2011) *Second Language Listening: Presage, Process, Product and Pedagogy.* In Hinkel, E. (Ed.) *Handbook of Research in Second Language Teaching and Learning, Volume II*. New York: Routledge, pp.455-471.

Vandergrift, L. and Tafaghodtari, M. H. (2010) 'Teaching L2 Learners How to listen Does Make a Difference: An Empirical Study' *Language Learning*, 60/2, 470-497.

Vanderplank, R. (1988) 'The Value of Teletext Sub-titles in Language Learning' *English Language Teaching Journal*, 42/4, 272-281.

Vanderplank, R. (1990) 'Paying Attention to the Words: Practical and Theoretical Problems in Watching Television Programmes with Uni-Lingual (CEEFAX) Sub-titles' *System*, 18/2, 221-234.

Vanderplank, R. (2013) ''Effects of' and 'Effects with Captions': How Exactly Does Watching a TV Programme with Same-language Subtitles Make a Difference to Language Learners?' *Language Teaching*, Available on CJO 2013 doi:10.1017/S0261444813000207.

"The VARK Questionnaire 7.1" (n.d.). Online. Available at http://vark-learn.com/the-vark-questionnaire/ (accessed 14 June 2015).

Webb, S. and Rodgers, M.P.H. (2009). 'The Vocabulary Demands of Television Programs' *Language Learning*, 59/2, 335-366.

"Why is the Earth Round - Stargazing live" (n.d.). BBC Two. Online. Available at https://www.youtube.com/watch?v=03MBkikLwXI (accessed 9 January 2015)

Wilson, J.J. (2008) *How to Teach listening*. Harlow: Pearson Longman.

Winke, P., Gass, S. and Sydorenko, T. (2010) 'The Effects of Captioning Videos Used for Foreign Language Listening Activities' *Language Learning and Technology*, 14/1, 65-86.

Winke, P., Gass, S. and Sydorenko, T. (2013) 'Factors Influencing the Use of Captions by Foreign Language Learners: An Eye-Tracking Study' *The Modern Language Journal*, 97/1, 254-275.

Wintergerst, A.C., DeCapua, A. and Itzen, R.C. (2001) 'The Construct Validity of One Learning Styles Instrument' *System*, 29, 385-403.

Wintergerst, A.C., DeCapua, A. and Verna, M.A. (2003) 'Conceptualizing Learning Style Modalities for ESL/EFL Students' *System*, 31, 85-106.

APPENDICES

APPENDIX A, Proposal

<u>Dissertation Proposal as part of the MA in TESOL</u>

Summer 2015

PROPOSAL

September 2015

Word count 2,721

1. __Introduction__

My own experience with learners in the L2 classroom has shown me that many students find listening to be the most difficult skill to develop. I have therefore found that helping students improve their listening skills has been one of the most rewarding aspects of being a teacher. Many of my students have found listening to native speakers a frustrating exercise; by helping them understand the various facets of connected speech and focusing on the enhancement of bottom-up skills, I have been able to introduce to them areas often neglected in course books. In addition, I always look to encourage learners to access authentic material such as DVDs and television recordings and this has led to an interest in finding out how helpful captions (subtitles in the same language as the audio content) are to L2 learners when watching authentic video.

2. __Motivation__

By conducting regular needs analyses with my classes I have noted that for many students listening is often placed near the top of the skills they would like to improve. I have also noticed that for some listening is an easier skill to acquire than for others. I consider this difference to be due to a range of factors related to individual differences between learners. Categorising individual differences involves taking into account a variety of, at times, overlapping features: abilities (intelligence; language aptitude; memory); propensities (learning style; motivation; anxiety; personality; willingness to communicate); learner cognitions about L2 learning (learner beliefs); learner actions (learning strategies) (Ellis, 2004).

The category of learning styles presents some difficulties in the literature with Dörnyei (2005) questioning whether they actually exist (but also failing to provide the answer to that question). Dörnyei (2005) does, however, recommend making a clear distinction between learning styles and cognitive styles. Sadler-Smith (2001) studied the relationship between the two taxonomies and concluded that the two fields are independent. Such clarity of division is not universal, however, and Ehrman, Leaver and Oxford (2003: 314) note that "the literature on learning styles uses the terms *learning style, cognitive style, personality type, sensory preference, modality,* and others rather loosely and often interchangeably". Taking a slightly different approach, Lincoln and Rademacher (2006: 486) view the literature as providing evidence that "students' preferred ways of absorbing and processing information are divisible into categories: cognitive, affective, environmental, sociological, and sensory". Sensory preferences may be sub-divided into visual, auditory and kinaesthetic/tactile; my study intends to identify learners' sensory preference type and then test their vocabulary recall, recognition and listening comprehension after watching videos with and without captions. This analysis should enable me to measure how the use of captions benefits different types of learner.

Over recent years the use of captioned video in the classroom has increased considerably. Several studies have been undertaken to assess various ways of measuring the effectiveness of captions. For example, studies have been conducted into how the combination of captions, sound and pictures can help improve listening comprehension (Markham, 2001; Winke, Gass & Sydorenko, 2010) or vocabulary acquisition (Nation, 2001). Research has been carried out on the different benefits between the various modes of input (Sydorenko, 2010), whether viewers benefit more from reading or listening and what visuals learners focus on (Winke, Gass & Sydorenko, 2013). Further studies have been based around lexical coverage (Van

Zeeland and Schmitt, 2013), word recognition (Markham, 1999; Bird and Williams, 2002) and whether learners benefit more from full captioning or key word captioning (Montero Perez, Peters, Clarebout and Desmet, 2014). Grgurovic and Hegelheimer (2007) studied how learners chose between using subtitles and transcripts in order to aid comprehension. In addition, other researchers have considered how different levels of proficiency, age, nationality and gender can affect the benefit of using captions. These individual differences are what interest me and specifically I am drawn to researching how the various types of learner (auditory, visual or kinaesthetic) benefit from the use of captions to accompany video.

3. **Approach**

My study will analyse and review the literature on two principal themes – learner sensory preference type and how captions may benefit learners. My research will provide data of a quantitative nature, with learners firstly responding to a questionnaire in order to establish sensory preference type and subsequently taking a listening comprehension test before finally answering vocabulary recognition and recall questions.

I intend to use my study to highlight how useful captioned video is to each type of sensory preference and this should be of benefit to classroom practitioners who would be able to choose whether, or how often, to use captions with their students based on identification of sensory preference type. Listening to video with captions in the classroom is very much an individual experience so perhaps greater focus should be placed on the individual and the differences between individuals.

3.1 <u>Literature review</u>

The review will be divided into six parts commencing with an overview of how the literature defines learning styles, before proceeding into a summary of the sensory preference types – how they are measured and what features the learners belonging to those types exhibit. The third and fourth parts examine ways in which the use of captions may reinforce the development of listening skills and vocabulary acquisition, respectively. The fifth part summarises the benefits of using captions with videos, while the research questions are introduced in the final section.

3.2 <u>Research questions</u>

The combination of the Sensory Preference Survey and the comprehension and vocabulary recognition and recall tests should allow for answers to the following research questions:

1. Does captioning relate to the extent to which L2 learners comprehend authentic videos?

2. Does captioning relate to the extent to which L2 learners recall vocabulary items from watching authentic videos?

3. Does captioning relate to the extent to which L2 learners recognise vocabulary items from watching authentic videos?

4. Does sensory preference style relate to the extent to which L2 learners comprehend authentic videos with captions?

5. Does sensory preference style relate to the extent to which L2 learners recall vocabulary items from watching authentic videos with captions?

6. Does sensory preference style relate to the extent to which L2 learners recognise vocabulary items from watching authentic videos with captions?

3.3 <u>Research design</u>

The first stage involves participants completing a questionnaire survey in order to establish their sensory preference type (visual, auditory or kinaesthetic); participants circle their immediate response to 30 behavioural statements on a five-point Likert scale and this then provides quantitative data of their sensory preference type. The responses are a self-assessment of participant behaviour and the survey is designed to be completed in approximately five minutes.

For the next stage participants watch two five minute video clips of a narrator presenting scientific facts about space exploration; the first viewing of the clips is without captions and the second viewing with, while for the control group both viewings are without captions. The viewing order reflects a study by Winke, et al. (2010) in which the learners either had the captions for their first or second viewing; although results showed that the ordering had little effect on the written vocabulary and comprehension tests, interviews with the participants tended to favour captions with the second viewing.

Following the viewing of the first video the participants are tested on the key words in the text (alongside distracters) through both active recall and active recognition. Next, their prior knowledge of the key vocabulary in the clip is elicited in order to identify any already known words. A five-point rating scale is used ranging from 'I definitely didn't know this word before watching the video' to 'I definitely knew this word before watching the video'. The

reason for giving the test after rather than before the listening is to prevent students from focusing on the key words during the listening; another option would be to increase the number of distracters contained in a pre-test of prior knowledge of the key words. However, as the key words are quite text-specific, and as the distracters should also be easier to answer, it would be difficult to pre-test the key words without expecting a consequent effect on their listening comprehension.

Finally, after testing vocabulary recognition and recall, participants take a three part comprehension test: 3 short answer questions, 3 true/false options and 3 multiple choice items. Exactly the same procedure (viewing without captions; viewing with captions; vocabulary test of key words; elicitation of prior knowledge of key words; listening comprehension test) is followed for the next video clip.

I considered the use of interviews as a supplement to the comprehension test; Dörnyei (2007) notes the usefulness of various ways of conducting interviews: single or multiple sessions; structured, unstructured or semi-structured. I have taken note, though, of previous research on captioning (Winke, et al., 2013) in which learners only spoke in general rather than more specific terms about the benefit of captions and so decided not to conduct interviews. While no structured interviews are to be conducted I will welcome feedback from the participants post testing on the procedures and how they felt about captioning.

I also considered the use of a free-recall task to check the participants' ability to recall information from the text. However, while a free-recall task can allow participants to randomly provide information they had remembered, it may be criticised for testing memory constraints rather than comprehension and for being difficult to administer in terms of

marking subjectivity. Therefore, in order to measure comprehension I decided to use a variety of tests: short answer questions; true/false options; multiple choice items. This test is an adaptation of a format used by Montero Perez, et al. (2014) and inspired by Buck's (2001: 114) default listening construct which measures the listener's ability to: "process extended samples of realistic spoken language, automatically and in real time"; "understand the linguistic information that is unequivocally included in the text"; "make whatever inferences are unambiguously implicated by the content of the passage".

4. **Participants**

These will be adult learners at a B2 proficiency level. It is likely that there will be between 10 and 20 participants in the experimental group and a similar number in the control group; the members will be recruited on a voluntary basis from my college. The participants will be provided with an information sheet explaining the main purpose of the study while avoiding the possibility of influencing the participants through too thorough an explanation of the research purpose.

5. **Ethics**

I will ensure the anonymity of the participants, provide a consent form to sign and explain to each participant that they are free to opt out of the study at any time. The questionnaire survey determines the participant's sensory type and the questions are of a general behavioural nature so are unlikely to offend or upset. The vocabulary and comprehension tests are based on listening texts on space research so, again, should not cause offence. Participants who have requested a summary of the overall study results will receive this after

completion; no individual level information of the findings will be provided. No vulnerable groups will be targeted and all participants will be adults. No incentives, financial or otherwise, will be offered. All retrieved data will remain confidential and anonymous. Participants will receive an information sheet and will be given the opportunity to review this sheet before deciding on whether to take part in the study or not. Potential participants will have the opportunity of a one to one meeting to raise any concerns about the study before deciding to participate. Participants will be reassured that they can leave the study at any time and that the results from testing will not impact on any evaluation of their progress in the course they are taking at my college. Prior to the start of data collection, appropriate written consent forms will be collected.

6. **Data collection and analysis**

All of the vocabulary and comprehension tests will be marked and graded by myself, awarding 2 points for a correct answer, 1 point for showing an awareness of the correct answer (e.g. using the infinitive rather than the participle form) and 0 points for an incorrect answer. For the active recall and active recognition vocabulary tests, any word that the participant indicates prior knowledge of will be excluded. The potential maximum number of points for vocabulary therefore is 12 for each of the active recall and recognition tests for both videos giving an overall maximum of 48. The comprehension tests, a combination of 3 short-answer questions, 3 true/false options and 3 multiple-choice items for each video, allow for a maximum score of 18 points. For the Sensory Preference Survey questionnaire (SPS), the participant's points will be measured against performance for the various modalities.

7. Limitations

There are several limitations to consider. Firstly, the participants will be at a B2 level meaning that results cannot be generalized to learners at different proficiency levels. In addition, even at the B2 level some participants will be better at listening than others. Furthermore, the content of the videos may not be interesting or may be too difficult, causing some of the participants to 'switch off'. Additionally, the key words in the videos may not be reflective of the participants' wider vocabulary awareness.

The wording of the SPS could be a further limitation; Dörnyei (2007: 103) warns that "minor differences in how a question is formulated and framed can often produce different levels of agreement and disagreement". The survey instructions discourage respondents from spending too long on one answer and this could result in participants rushing, meaning that they might be inclined to answer differently were they to retake the survey. DeCapua and Wintergerst (2005: 9) believe that this approach may result in participants tending to "just get it done" rather than consider their responses more carefully. DeCapua and Wintergerst (2005: 7) also note how important context is in such questionnaires, adding that a different context could lead to a different selection by a participant. Preferably the survey questions should be more reflective of a classroom setting; for example, prompts such as 'I think better when I move around (e.g., pacing or tapping my feet)' could be replaced with, 'I enjoy mingling activities (e.g., when we get out of our seats and ask each other questions)'. Long (2005: 38) highlights problems with "double-barreled questions" (e.g. "Do you read and write letters to your customers in English?"); therefore, the survey could be criticised on phrasing such as "I prefer to learn by listening to a lecture rather than reading". However, to modify the questions could compromise the validity of a survey used effectively in other studies.

As some studies of sensory preferences have used different categories it will be difficult to make direct comparisons; on this basis, studies employing the VARK Questionnaire (which alongside visual, auditory, kinaesthetic and mixed also contains a read/write category) and Reid's PLSPQ (which lists visual, auditory, kinaesthetic, tactile, group and individual) are not easily comparable.

Additionally, this study tests the prior word knowledge of participants by relying on their perception of whether the word had been known before watching the video. The test of prior word knowledge may also have some limitations due to cultural issues. For example, DeCapua and Wintergerst (2005: 10) noted that students from certain Asian countries may be uncomfortable with the adverb *never* in the Likert scale as it may be seen as too negative a response; likewise, the use of *always* may be avoided due to it being seen as seen too strong a response.

The lack of empirically proven research into vocabulary thresholds required for listening attainment is a further limitation. Studies on vocabulary acquisition and comprehension through listening should not be based on studies into L2 reading skills; as Van Zeeland and Schmitt (2013: 458) stressed, "vocabulary plays a different role in the two modalities". The study might also be viewed as being more robust if it included a test of passive recall and passive recognition alongside active recall and active recognition

Finally, the comprehension tests are designed around Buck's (2001: 114) default listening construct, thereby measuring the listener's ability to: "process extended samples of realistic spoken language, automatically and in real time; understand the linguistic information that is unequivocally included in the text; make whatever inferences are unambiguously implicated

by the content of the passage." It should be noted though that the test construct has not been empirically validated.

References

Bird, S.A. and Williams, J.N. (2002) 'The Effect of Bimodal Input on Implicit and Explicit Memory: An Investigation into the Benefits of Within-Language Subtitling' *Applied Psycholinguistics*, 23/4, 509-533.

Buck, G. (2001) *Assessing Listening*. Cambridge: Cambridge University Press.

DeCapua, A. and Wintergerst, A.C. (2005) 'Assessing and Validating a Learning Styles Instrument' *System*, 33, 1-16.

Dornyei, Z. (2005) *The Psychology of the Language Learner: Individual Differences in Second Language Acquisition*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.

Dörnyei, Z. (2007) *Research Methods in Applied Linguistics*. Oxford: Oxford University Press.

Ehrman, M.E., Leaver, B.L. and Oxford, R.L. (2003) 'A Brief Overview of Individual Differences in Second Language Learning' *System*, 31/3, 313-330.

Ellis, R. (2004) "Individual Differences in Second Language Learning". In Davies, A. and Elder, C. (Eds) *The Handbook of Applied Linguistics*. Malden, MA: Blackwell, pp.525-551.

Grgurović, M. and Hegelheimer, V. (2007) 'Help Options and Multimedia Listening: Students' Use of Subtitles and the Transcript' *Language Learning & Technology*, 11/1, 45-66.

Long, M. (2005) *Methodological Issues in Learner Needs analysis.* In Long, M. (Ed.) *second Language Needs Analysis*. Cambridge: Cambridge University Press, pp.19-76.

Markham, P.L. (1999) 'Captioned Videotapes and Second-Language Listening Word Recognition' *Foreign Language Annals*, 32/3, 321-328.

Markham, P.L. (2001) 'The Influence of Culture-Specific Background Knowledge and Captions on Second Language Comprehension' *Journal of Educational Technology Systems*, 29/4, 331-343.

Montero Perez, M., Peters, E., Clarebout, G. and Desmet, P. (2014) 'Effects of Captioning on Video Comprehension and Incidental Vocabulary Learning' *Language Learning & Technology*, 18/1, 118-141.

Nation, I.S.P. (2001) *Learning Vocabulary in Another Language*. Cambridge: Cambridge University Press.

Reid, J.M. (1984) *Perceptual Learning Styles Preference Questionnaire*. Copyrighted.

Sadler-Smith, E. (2001) 'The Relationship between Learning Style and Cognitive Style' *Personality and Individual Differences*, 30, 609-616.

Sydorenko, T. (2010) 'Modality of Input and Vocabulary Acquisition' *Language Learning & Technology*, 14/2, 50-73.

Van Zeeland, H. and Schmitt, N. (2013) 'Lexical Coverage in L1 and L2 Listening Comprehension: The Same or Different from Reading Comprehension' *Applied Linguistics*, 34/4, 457-479.

"The VARK Questionnaire 7.1" (n.d.). Online. Available at http://vark-learn.com/the-vark-questionnaire/ (accessed 14 June 2015).

Winke, P., Gass, S. and Sydorenko, T. (2010) 'The Effects of Captioning Videos Used for Foreign Language Listening Activities' *Language Learning & Technology*, 14/1, 65-86.

Winke, P., Gass, S. and Sydorenko, T. (2013) 'Factors Influencing the Use of Captions by Foreign Language Learners: An Eye-Tracking Study' *The Modern Language Journal*, 97/1, 254-275.

APPENDIX B, Study information sheet

22 May 2015

<u>**STUDY INFORMATION SHEET:**</u>

Effects of the use of captions with video

I would like to invite you to participate in a research study that examines the effects of the use of captions when watching a video. In particular, the project intends to investigate how captions benefit different types of learners in terms of vocabulary recognition and listening comprehension. I am an MA student on the MA in TESOL course XXXXX, interested in second language learning and teaching and a Senior Teacher and Teacher Trainer at XXXX.

If you decide to participate, I will ask you to take part in one session in a classroom at XXXXX. You will be asked to complete a short questionnaire to determine your learner characteristics. You will then watch two videos twice and after each video you will complete brief vocabulary and comprehension tests. You will be presented with the videos on the Interactive Whiteboard. The session will last approximately 60-70 minutes.

At every stage of the project and beyond, your name will remain confidential. Your identity will be anonymised by the use of a unique identifier. Any data obtained from you will be kept securely. I will be the only person who will have access to the dataset, which will be stored for approximately 10 years.

I will share the overall results of the study with you via e-mail. The overall results of the study, without reference to individual participants, may also be presented at professional second language conferences and in research publications.

You are free to withdraw from the study at any time without reason and without any impact on you. If you decide to withdraw, any data collected from you will be destroyed. If you have any queries about the study, please feel free to contact me at XXXX.

I would be very grateful if you would agree to take part!

XXXX

APPENDIX C, Consent form

<u>CONSENT FORM</u>

Project title: *Effects of the use of captions with video*

		YES	NO
1.	I have read and had explained to me by XXXX the Information Sheet relating to this project.	☐	☐
2.	I have had explained to me the purposes of the project and what will be required of me, and any questions have been answered to my satisfaction. I agree to the arrangements for my participation as described in the Information Sheet.	☐	☐
3.	I understand that my participation is entirely voluntary and that I have the right to withdraw from the project any time.	☐	☐
4.	I agree with the contents of this Consent Form and have received the accompanying Information Sheet.	☐	☐

Name:

Signed:

Date:

APPENDIX D, Sensory Preference Survey questionnaire

Sensory Preference Survey: How I Use My Physical Senses (adapted from Learning Style Survey (Cohen, Oxford and Chi (2006))

Instructions: For each item circle the response that represents your approach. Complete all items. Do not spend too much time on any item. Indicate your immediate response (or feeling) and move on to the next item. For each item, circle your immediate response:

0 = Never   1 = Rarely   2 = Sometimes   3 = Often   4 = Always

1.	Background sound helps me think.	**0**	**1**	**2**	**3**	**4**
2.	I have to look at people to understand what they say.	**0**	**1**	**2**	**3**	**4**
3.	I can understand what people say even when I cannot see them.	**0**	**1**	**2**	**3**	**4**
4.	I need written directions for tasks.	**0**	**1**	**2**	**3**	**4**
5.	I use colour coding to help me as I learn or work.	**0**	**1**	**2**	**3**	**4**
6.	I remember people's faces, but not their names.	**0**	**1**	**2**	**3**	**4**
7.	I prefer to learn with TV or video rather than other media.	**0**	**1**	**2**	**3**	**4**
8.	I need oral directions for a task.	**0**	**1**	**2**	**3**	**4**
9.	I play with or bite on my pens during lectures.	**0**	**1**	**2**	**3**	**4**
10.	Charts, diagrams and maps help me understand what someone says.	**0**	**1**	**2**	**3**	**4**
11.	I take detailed notes during lectures.	**0**	**1**	**2**	**3**	**4**
12.	I remember something better if I write it down.	**0**	**1**	**2**	**3**	**4**
13.	I need frequent breaks when I work or study.	**0**	**1**	**2**	**3**	**4**
14.	I need to eat something when I read or study.	**0**	**1**	**2**	**3**	**4**

15.	I remember things better if I discuss them with someone.	**0**	**1**	**2**	**3**	**4**
16.	If I have a choice between sitting and standing, I'd rather stand.	**0**	**1**	**2**	**3**	**4**
17.	Moving and handling objects helps me to remember what someone says.	**0**	**1**	**2**	**3**	**4**
18.	I think better when I move around (e.g., pacing or tapping my feet).	**0**	**1**	**2**	**3**	**4**
19.	I can identify people by their voices (e.g., on the phone).	**0**	**1**	**2**	**3**	**4**
20.	When I turn on the TV, I listen to the sound more than watch the screen.	**0**	**1**	**2**	**3**	**4**
21.	I understand lecturers better when they write on the board.	**0**	**1**	**2**	**3**	**4**
22.	I draw lots of pictures (doodles) in my notebook during lectures.	**0**	**1**	**2**	**3**	**4**
23.	I prefer to learn by listening to a lecture rather than reading.	**0**	**1**	**2**	**3**	**4**
24.	I get nervous when I sit still too long.	**0**	**1**	**2**	**3**	**4**
25.	I remember people's names, but not their faces.	**0**	**1**	**2**	**3**	**4**
26.	I move my hands when I speak.	**0**	**1**	**2**	**3**	**4**
27.	I like to listen to music when I study or work.	**0**	**1**	**2**	**3**	**4**
28.	When I listen, I visualise pictures, numbers, or words in my head.	**0**	**1**	**2**	**3**	**4**
29.	I'd rather get started than pay attention to the directions.	**0**	**1**	**2**	**3**	**4**
30.	I easily remember jokes that I hear.	**0**	**1**	**2**	**3**	**4**

NAME_____ DATE_____

APPENDIX E, Audio script, video 1

.08 Now I suppose you can see why there might have been some debate because from here the Earth certainly looks flat.

.16 Now everybody knows that it's round but how do you know? You know because someone told you

.25 and I suppose if you really think that seeing is believing then you would've had to wait until we left our

.32 planet, journeyed off into space, turned around and took a picture to see our beautiful

.39 spherical Earth in all its glory. This is the first ever photograph taken

.46 from space of the Earth fully illuminated by the sun, taken in 1972

.53 by the Apollo seventeen astronauts as they travelled to the moon. It became the most viewed image in history and was named

1.00 the blue marble. This shape is echoed throughout the universe.

1.10 Look at every star and every planet and you'll see that the sphere is dominant.

1.17 And it's all because of gravity, the same thing that keeps our feet firmly rooted to the floor.

1.25 With gravity the bigger the mass the stronger the attraction.

1.32 Now I'm not very massive compared to a planet and neither is this pier so the gravitational force

1.38 that this rock feels is overwhelmingly dominated by the Earth and so when I drop it

1.45 it falls directly towards the centre of the Earth and that's the reason the planets are the shape that they are.

1.54 It's because gravity attracts everything towards the centre of a planet that they form as spheres.

2.01 In the early days in the life of the solar system our young sun was surrounded by lots

2.09 of dust and rocks but some pieces of rock were bigger than others and that meant that they had slightly stronger

2.16 gravity so they attracted more and more smaller pieces to them and they grew and they became bigger and bigger and bigger.

2.26 And over tens of millions of years these bodies grew so big that they eventually became planets.

2.33 Now gravity doesn't have a preferred direction. You know it doesn't care whether it pulls things in from over there

2.38 over here, over here, over here. So what kind of shape would gravity tend to form?

2.45 Well it's not going to form an irregular shape like this. Because gravity doesn't care about direction it will form a shape

2.54 that doesn't care about direction either. Now the only shape in nature that looks the same from every direction

3.02 is a sphere. It's the most symmetrical shape in the universe and that's why you see it everywhere.

3.10 Now it's not easy to mould solid rock into a sphere but gravity gives planets a helping hand

3.16 to form that perfect shape. Now imagine this is one of those small pieces of rock falling towards the young

3.23 ever growing Earth. Now when it hits the ground it delivers energy to it and you hear some of that

3.29 as sound but some of it also goes into heat. Now imagine over millions and millions of years as the Earth grows

3.38 how many millions and millions of pieces of rock smash into the Earth and make it grow.

3.45 They deliver a huge amount of energy to the Earth.

3.51 And all that energy made the centre of our planet get so hot that it melted its solid core making it

3.58 even easier for the sphere to form. And incredibly some of that heat is still escaping today helping to

4.06 fuel volcanoes across the Earth's surface. Gravity is the reason that our planet is spherical but

4.14 it doesn't always win out. Not everything in space is quite as perfect. So spheres are fickle things,

4.24 they only form over a certain size. There are rocks and pebbles on these beaches. All have their own gravity

4.32 but it's far too weak to reshape the structure of the rocks into spheres. So, just like these beaches

4.40 the solar system is littered with odd shaped rejects.

4.47 At 27 kilometres across, Mars' moon Phobos is so tiny it looks more like a potato

4.54 than a planet, and covered in craters the strangest of them all is Saturn's spongelike moon Hyperion

5.01 which looks unlike anything else in the solar system.

5.06 On average moons must reach about 500 kilometres in size before they have enough mass

5.11 for their gravity to shape them into a sphere.

5.16 The solar system is a world of spheres but there are plenty of places out there that never

5.21 quite made it. And it's quite a thought to think that if our Earth had been much smaller then gravity

5.28 would not have been strong enough to sculpt it into that beautiful perfect blue marble that we see hanging

5.35 against the blackness of space.

APPENDIX F, Active recall test, video 1

NAME_____ DATE_____

For each description provide another word with the same meaning. The word should begin with the first letter provided:

1) A synonym for definitely *c*_____

2) The shape of the Earth is *s*_____

3) To have looked at something distant *v*_____

4) Almost completely *o*_____

5) Fine particles like a powder *d*_____

6) To describe a type is to describe a *k*_____

7) To be equal in shape *s*_____

8) To make something into a particular shape *m*_____

9) To send something from one place to another *d*_____

10) The central part of an object *c*_____

11) The area next to the sea *b*_____

12) A typical size or amount *a*_____

APPENDIX G, Active recognition test, video 1

NAME_____ DATE_____

For each description select another word with the same meaning and circle it.

1) *A synonym for definitely* a. convincingly b. certainly c. conventionally d. comparably

2) *The shape of the Earth is* a. substantial b. shallow c. secular d. spherical

3) *To have looked at something distant* a. viewed b. vouched c. valued d. verified

4) *Almost completely* a. outstandingly b. outwardly c. overwhelmingly d. overly

5) *Fine particles like a powder* a. dirt b. debris c. deposits d. dust

6) *To describe a type is to describe a* a. kit b. key c. kind d. kindness

7) *To be equal in shape* a. sizeable b. similar c. symmetrical d. synonymous

8) *To make something into a particular shape* a. mend b. melt c. mix d. mould

9) *Sending something from one place to another* a. derails b. destines c. deals d. delivers

10) *The central part of an object* a. core b. column c. cone d. commune

11) *The area next to the sea* a. backwash b. backwater c. beach d. beech

12) *A typical size or amount* a. approximate b. average c. absolute d. assumed

APPENDIX H, Test of prior knowledge of vocabulary, video 1

Test of Prior Knowledge of Vocabulary: Why the Earth is round

Instructions: For each word circle the response that represents your knowledge of this word before you watched the video.

Complete all items. Do not spend too much time on any item:

1 = ***I definitely didn't know*** this word before watching the video

2 = I think there is ***a good possibility I didn't know*** this word before watching the video

3 = I am ***not sure if I knew*** this word before watching the video

4 = I think there is ***a good possibility I knew*** this word before watching the video

5 = ***I definitely knew*** this word before watching the video

certainly	**1**	**2**	**3**	**4**	**5**
spherical	**1**	**2**	**3**	**4**	**5**
viewed	**1**	**2**	**3**	**4**	**5**
overwhelmingly	**1**	**2**	**3**	**4**	**5**
dust	**1**	**2**	**3**	**4**	**5**
kind	**1**	**2**	**3**	**4**	**5**

symmetrical	**1**	**2**	**3**	**4**	**5**
mould	**1**	**2**	**3**	**4**	**5**
delivers	**1**	**2**	**3**	**4**	**5**
core	**1**	**2**	**3**	**4**	**5**
beach	**1**	**2**	**3**	**4**	**5**
average	**1**	**2**	**3**	**4**	**5**

NAME_____ DATE_____

APPENDIX I, Comprehension test, video 1

NAME_____ DATE_____

1) **Indicate if the statement is true or false. If false correct it.**

a) The first photograph of Earth taken from space was in 1972.

b) The photograph became the most viewed image ever.

c) Every moon is a globe like the Earth.

2) **Choose one of the following alternatives.**

a) How is Earth described?

    i)   A blue marvel

    ii)   A blue marble

    iii)   A true marvel

    iv)   A true marble

b) How many years did it take for planets to form?

    i)   Tens of thousands

    ii)   Hundreds of thousands

    iii)   Tens of millions

    iv)   Hundreds of millions

c) What is the only shape that looks the same from every direction?

    i)   A cube

ii)   A diamond

iii)   A cone

iv)   A sphere

3) Provide an answer to the following questions:

a) What is the most common shape in the universe?

b) What types of energy are sent when a rock hits the ground?

c) How large do moons have to be before they become spheres?

APPENDIX J, Audio script, video 2

.04 Io sits about the same distance from Jupiter as our own moon does from Earth

.09 but don't forget that orbiting outside Io are its sister moons Europa and Ganymede.

.18 Io is under the influence not just of the massive gravitational pull of Jupiter

.24 but also the additional pull of its neighbouring moons.

.29 It's this gravitational tug of war that conspires to breathe life into Io.

.34 Io has a very interesting relationship with Europa

.40 and Ganymede because for every four of orbits that Io makes around the planet

.46 Europa goes around almost exactly twice and Ganymede goes around just once.

.54 Periodically they line up together, bang bang bang

.59 and Io gets a powerful gravitational kick on a very regular basis

1.06 and that has the effect of moving Io out of a nice circular orbit into

1.12 an elliptical or an eccentric orbit. Io comes close to Jupiter and then far away

1.18 from Jupiter and then close to Jupiter again and because Jupiter's gravity is so big

1.24 that has the effect of stretching and squashing Io.

1.29 Now imagine if it was a squash ball, if you stretch and squash and stretch and squash

and it gets hot by friction and the

1.34 same thing happens to this moon. The power of the gravitational interaction between

Jupiter and Io is

1.39 extraordinary. It contorts the shape of this tiny moon

1.46 moving rock as if it were nothing more than water.

1.51 Now this crater is about what thirty meters from the base that you can see down there

1.57 up to the edge of the rim. Now, Io when it

2.02 orbits around Jupiter every one point eight days flexes by something like

2.07 a hundred metres. That's three times the height of that crater. Remember Io's

2.12 surface is pretty much like this, solid rock.

2.17 So imagine how much energy that takes and all that energy comes from Jupiter's

2.23 gravitational field and that is the energy that powers the volcanoes.

2.38 Io is a world beyond our imagination. Its unique

2.43 gravitational connections provide a seemingly inexhaustible supply of heat.

2.48 As well as its huge lava lakes the heat also powers the largest volcanic eruptions

2.56 in the solar system.

3.06 Molten rock and gas blasts out from the frigid surface the

3.12 gas expands, shattering lava into a giant fountain of fine particles.

3.24 With weak gravity and a sparse atmosphere Io's volcanic plumes can

3.30 reach five hundred kilometres above the moon's surface.

3.52 And this incredible phenomena volcanism comes from the simplest of laws of physics.

4.00 The, the law that says that heat contained in a planet must eventually find a way to escape

4.07 into the coldness of space. But what a spectacular way for the laws of physics to play out.

4.17 In the most unexpected of places, in the coldest reaches of the solar system the laws of physics

4.25 created a fiery world of wonder. And Io is not alone. Many of the

4.31 hundreds of moons in the solar system are not dead barren and uninteresting

4.37 worlds but active, often violent and always beautiful worlds of wonder.

4.50 Io is fascinating. It doesn't derive its energy from an internal heat source

4.56 in the same way that the Earth does. It extracts energy from its orbit around

5.02 its giant parent planet Jupiter and for all those reasons Io is a wonder of the solar system.

APPENDIX K, Active recall test, video 2

NAME_____ DATE_____

For each description provide another word with the same meaning. The word should begin with the first letter provided:

1) A moon moving around a planet is *o*_____

2) Something extremely large is *m*_____

3) To have an effect on something else *i*_____

4) A very strong force *p*_____

5) Making something longer by pulling both ends *s*_____

6) Making something smaller by squeezing it *s*_____

7) Change something into an unnatural shape *c*_____

8) The top layer of an object *s*_____

9) When only one exists *u*_____

10) A solid that has become liquid *m*_____

11) Breaking into very small pieces *s*_____

12) To happen after some time *e*_____

APPENDIX L, Active recognition test, video 2

NAME_____ DATE_____

For each description select another word with the same meaning and circle it.

1) *A moon moving around a planet is* a. oscillating b. overtaking c. orbiting d. offsetting

2) *Something extremely large is* a. mature b. malice c. marginal d. massive

3) *To have an effect on something else* a. influence b. image c. identity d. illusion

4) *A very strong force* a. permanent b. productive c. powerful d. plentiful

5) *Making something longer by pulling both ends* a. shrinking b. stretching c. smashing d. speeding

6) *Making something smaller by squeezing it* a. standing b. slapping c. squashing d. spreading

7) *Change something into an unnatural shape* a. connect b. contrive c. consider d. contort

8) *The top layer of an object* a. surface b. stump c. step d. spring

9) *When only one exists* a. unclear b. unique c. unknown d. untold

10) *A solid that has become liquid* a. mashed b. massed c. molten d. merged

11) *Breaking into small pieces* a. snapping b. shattering c. slapping d. sorting

12) *To happen after some time* a. exceptionally b. eventually c. erratically d. emphatically

APPENDIX M, Test of prior knowledge of vocabulary, video 2

Test of Prior Knowledge of Vocabulary: **Explosive Planet**

Instructions: For each word circle the response that represents your knowledge

of this word before you watched the video.

Complete all items. Do not spend too much time on any item:

1 = *__I definitely didn't know__* this word before watching the video

2 = I think there is *__a good possibility I didn't know__* this word before watching

the video

3 = I am *__not sure if I knew__* this word before watching the video

4 = I think there is *__a good possibility I knew__* this word before watching the

video

5 = *__I definitely knew__* this word before watching the video

orbiting	**1**	**2**	**3**	**4**	**5**
massive	**1**	**2**	**3**	**4**	**5**
influence	**1**	**2**	**3**	**4**	**5**
powerful	**1**	**2**	**3**	**4**	**5**
stretching	**1**	**2**	**3**	**4**	**5**
squashing	**1**	**2**	**3**	**4**	**5**

contort	**1**	**2**	**3**	**4**	**5**
surface	**1**	**2**	**3**	**4**	**5**
unique	**1**	**2**	**3**	**4**	**5**
molten	**1**	**2**	**3**	**4**	**5**
shattering	**1**	**2**	**3**	**4**	**5**
eventually	**1**	**2**	**3**	**4**	**5**

NAME_____ DATE_____

APPENDIX N, Comprehension test, video 2

NAME_____ DATE_____

1) **Indicate if the statement is true or false. If false correct it.**

a) Io is about the same distance from Jupiter as the moon is from Earth.

b) Jupiter orbits around Io.

c) Sometimes all of Jupiter's moons line up together.

2) **Choose one of the following alternatives.**

a) For every orbit Ganymede makes, how many orbits does Io make?

   i) One

   ii) Two

   iii) Three

   iv) Four

b) When all the moons line up what happens to Io's orbit?

   i) It stays closer to Jupiter

   ii) It moves farther away from Jupiter

   iii) It moves closer then further

   iv) It stays the same

c) What effect does gravity have on the shape of Io?

i) It gets fatter

ii) It gets thinner

iii) It gets thinner and fatter

iv) It stays the same

4) Provide an answer to the following questions:

a) What happens to a squash ball if you stretch and squash it?

b) What eventually happens to heat contained in a planet?

c) What is the force that shapes planets into spheres?