Chapter 1

General introduction

During the past two decades, the concept of bilingualism has attracted a considerable amount of public attention. As a result of the increased mobility of large parts of the world population, more and more people nowadays are to some extent proficient in multiple languages. In western society the awareness has therefore grown that bilingualism can in certain respects be considered an asset. In educational settings, for instance, English is gradually replacing native languages as the language of preference. Apart from the practical benefit of speaking more than one language, bilingualism is sometimes seen as a cultural advantage, offering better understanding of other cultures and ideas, and is even claimed as offering metalinguistic advantages (see e.g. Baker & Jones, 1998, p. 7). This interest in bilingualism also reflects a change in attitude that goes much further than a mere appreciation of its practical benefits. According to traditional views, speaking two languages could lead to a higher incidence of stuttering in children (Dale, 1977; Howell, Davis & Williams, 2009; but see for a reaction Packman, Onslow, Reilly et al. 2009) and even to retardation in children’s development (c.f. Darcy, 1963). A first landmark in the changing attitude towards bilingualism is a study by Peal and Lambert (1962), which compares performance on a number of verbal and non-verbal tests by groups of monolingual and bilingual children which had been carefully matched, because factors such as age and socio economic status had been controlled for. In contrast to earlier studies, the bilinguals did not show any disadvantages in performance, but they outperformed the monolingual children in a number of both verbal and non-verbal intelligence tests,
particularly those requiring mental flexibility. They had hit upon a phenomenon that decades later became known as the ‘bilingual advantage’.

Despite the positive evidence reported by Peal and Lambert, the concerns about potential negative effects of bilingualism were not assuaged, so that children remained the objects of bilingual research. Twenty-six years later, Bialystok (1988) came up with evidence that bilingual children performed better than monolingual children in metalinguistic tasks requiring controlled attention and inhibition, i.e. tasks in which they had to judge grammaticality, while ignoring misleading distraction from meaning. These findings led to a number of studies on the question whether such a bilingual advantage would extend to nonverbal domains as well. Indeed, several studies (e.g. Bialystok, 1999; Bialystok & Martin, 2004) reported an advantage for bilingual over monolingual children in a number of cognitive tasks tapping into executive control, particularly inhibition. Later on, these studies were extended to groups of adults, and similarly, a few studies reported an advantage for bilinguals over monolinguals (Bialystok, Craik, Klein & Viswanathan, 2004; Costa, Hernández and Sebastián-Gallés, 2008). Thus, Peal and Lambert’s evidence seemed to be confirmed: bilinguals had been found to be at an advantage instead of a disadvantage compared to monolinguals in general cognitive functioning.

However, when more studies were carried out in this field, matters appeared more complicated than they had seemed at first. A few seminal studies reporting an advantage for bilinguals could not be replicated (e.g. Bialystok et al., 2004), so that it was not clear whether this advantage was really there. As a result, there was a growing uncertainty about the presence of the bilingual advantage, and when it was found, about its nature. Studies
often disagreed in which aspect of executive functioning bilinguals would be better than monolinguals, and whether this advantage would confer to other types of bilingualism.

Another point is that, unlike general cognitive functioning, as regards verbal cognitive functioning most studies still agree that bilinguals tend to be at a disadvantage compared to monolinguals (c.f. Bialystok, 2009). For children, this is reflected mainly in the fact that bilinguals have smaller vocabularies in each of their languages than monolinguals (Mahon & Crutchley, 2006), while bilingual adults are usually found to be slower in lexical access (c.f. Gollan & Acenas, 2004). The observation that bilingualism is thus associated with negative effects on linguistic performance, but simultaneously with a possible enhancement of certain nonverbal cognitive functions, led Bialystok, Craik and Luk (2008a) to hypothesize that there might even be a common explanation for these two phenomena. That is, the interference of the non-target language during bilingual language processing would on the one hand hamper lexical access, but simultaneously strengthen certain executive control systems because of their involvement in language processing.

Performance both on tasks tapping into executive control (cf. Hasher et al, 2001; Hobson & Leeds, 2001) and into rapid lexical access (cf. Brickman et al., 2005), tends to decline with aging. In the case of executive control tasks, the fact that bilinguals reportedly show advantages here may lead to interesting interactions between bilingualism and aging. Indeed, a study by Bialystok, Craik, Klein and Viswanathan (2004) reports an association between bilingualism and a modulation of age-related decline in the efficiency of executive control. In the case of lexical access, we may expect interactions between bilingualism and aging as well. Bilingualism might aggravate the age-related decline in lexical access, but it
is also possible that a modulation in elderly bilinguals of age-related decline in aspects of general cognitive functioning may lead to better performance in linguistic tasks, as well.

The observations sketched above led us to initiate a study in which we explore associations between bilingualism, cognitive performance and aging. In particular, in this study we investigate in how far we can find evidence for either advantages or disadvantages in general and linguistic cognitive functioning for bilinguals compared to monolinguals. With this aim, we compare performance on a number of cognitive tasks between adult groups of early bilinguals, late bilinguals and functional monolinguals. First, we look at possible associations between bilingualism and executive control functions that may play a part in language processing. Second, we investigate associations between bilingualism and linguistic performance. In view of evidence for potential interactions between bilingualism and aging, we focus on the performance of elderly and middle-aged participants, both in verbal and nonverbal tasks. Last, we address the hypothesis that bilinguals’ conflict between competing language systems can simultaneously result in disadvantages in lexical access and in a boost of executive control functions, because of their involvement in multiple language processing. With this in mind, we analyse interactions between the results of the verbal and nonverbal tasks of our experiment within the group of early bilingual participants.

1.1. The outline of this dissertation

The next chapter of this dissertation is the theoretical background section, which provides a brief overview of the literature published in this research field and leads to a definition of the research questions of our study. Chapter 3 reports on the analyses that we
conducted within the group of early bilinguals, on the results of both the general and the linguistic tasks. Chapter 4 reports on the comparison of the performance of the early bilinguals and the monolinguals on the general cognitive task. Chapter 5 compares the performance on the same cognitive task of these groups with that of a group of late bilinguals. Chapter 6 reports on the comparison of the performance of the early bilinguals and the monolinguals on the verbal task. Chapter 7 is a general discussion of the entire study, combining the results presented in the foregoing chapters and answering the research questions that are outlined in chapter 2. Chapter 8 is the conclusion, providing a brief summary of the study and suggesting possible directions for future research in the field.

Because chapters 3, 4, 5, and 6 are all based on articles that were submitted to peer-reviewed journals, a number of sections, in particular on the methodology of this study, are sometimes repeated across the different chapters.