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Rebekah Rast. Foreign Language Learning and Teaching: From first exposure to first productions . Linguistics. Université Grenoble Alpes, 2017. tel-01668470

HAL Id: tel-01668470

<https://hal.science/tel-01668470>

Submitted on 20 Dec 2017

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**Mémoire de Synthèse en vue de
l'obtention de l'Habilitation à Diriger des
Recherches**

L'UNIVERSITÉ GRENOBLE ALPES

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***L'apprentissage et l'enseignement d'une
langue étrangère :
De l'exposition initiale aux premières
productions***

***Foreign Language Learning and Teaching:
From first exposure to first productions***

Volume I : Mémoire

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Remerciements

Je voudrais avant tout remercier John Osborne, mon garant, et les membres du jury de m'avoir fait l'honneur de lire et d'évaluer ce travail.

Depuis notre première étude sur l'acquisition de la langue polonaise en 1996, je travaille en étroite collaboration avec Marzena Wątopek. C'est à elle que je dois ma plus vive gratitude. Le travail décrit dans cette thèse d'habilitation n'aurait jamais vu le jour sans l'excellence, l'inspiration, la détermination et l'humour qu'a apportés Marzena à notre travail.

Pour leur coopération précieuse, je remercie également les membres du Laboratoire *Structures formelles du langage*, en particulier son directeur, Clive Perdue, et ses directrices, Maya Hickmann et Sophie Wauquier.

Je tiens à remercier enfin mes collègues de l'Université américaine de Paris pour leur soutien indéfectible et leurs constants encouragements. Je n'oublie pas évidemment mes étudiants et étudiantes dont les questions et les contributions ont sans cesse enrichi mes propres réflexions de recherche.

Les recherches en acquisition des langues s'appuient souvent sur un travail d'équipe. Ceci a bien été mon cas depuis 20 ans. Dans le mémoire, je remercie mes collègues en lien avec les études que nous avons menées ensemble. Ce travail aurait été parfaitement impossible sans les contributions spécialisées de chacune de ces personnes.

Et enfin, pour leur présence, qui, dans mes journées souvent trop chargées, est toujours synonyme de plaisir, je remercie James et Ella du fond du cœur.

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L'apprentissage et l'enseignement d'une langue étrangère : de l'exposition initiale aux premières productions

Synthèse du mémoire

Introduction

Le mémoire d'habilitation offre au chercheur une occasion précieuse de prendre du recul vis-à-vis de son travail de recherche, de rendre compte de son évolution et d'identifier plus clairement des relations entre différents aspects de la recherche envisagés parfois séparément.

En ce qui me concerne, je me suis investie dans l'aventure scientifique en 1994 lorsque j'étais encore professeure d'anglais et formatrice des enseignants de langues. Mes questions de recherche ont vu le jour suite à mes enseignements de l'époque, la question principale étant : Quel est le rôle des éléments linguistiques fournis par l'enseignant en classe de langue dans l'apprentissage de cette langue par les apprenants adultes ? En effet, pour le cours de *TESOL Methodologies*, je faisais lire à mes étudiants le livre *Making Communicative Language Teaching Happen* (Lee et VanPatten 1995), une approche inspirée des recherches sur l'acquisition d'une langue seconde mettant fortement l'accent sur le rôle de l'entrée linguistique (*input*) à travers l'approche communicative. Dans le cours de *Pedagogical Grammar*, on travaillait sur le texte *Transformational Grammar* (Radford 1988) afin de mieux comprendre les défis auxquels les apprenants d'anglais langue étrangère étaient confrontés. C'est en travaillant sur ces deux textes avec mes étudiants que mes questions de recherche se sont cristallisées.

L'envie de les explorer m'a poussée à poursuivre mes études en France, en DEA de Sciences du Langage à l'Université de Paris 8. La rencontre avec mon futur directeur de mémoire de DEA a été décisive dans la définition de la problématique de ma recherche. Plusieurs personnes m'avaient indiqué le nom de Clive Perdue, chercheur qui a mené une vaste étude sur l'acquisition des langues étrangères par des adultes immigrés à l'échelle européenne. J'avais fait la connaissance de Clive Perdue lors de ma première participation à un colloque sur l'acquisition des langues, la conférence annuelle de la *European Second Language Association* (EuroSLA) à Nimègue (Pays-Bas). C'est là que j'ai pu lui communiquer mon intention de poursuivre mes études en France et mon intérêt de faire des recherches sur le rôle de l'*input* dans l'acquisition. On avait convenu de se téléphoner. C'est lors de cette conversation téléphonique qui m'a profondément marquée, que ma recherche actuelle a pris la direction que je poursuis depuis. Clive Perdue m'avait proposé d'intégrer un projet ayant pour but de tester la théorie de Chomsky sur la faculté du langage pour

l'acquisition d'une langue étrangère à travers une étude de l'*input*. À l'issue de la discussion, il m'a demandé si j'étais prête à apprendre une nouvelle langue étrangère, le polonais, langue typologiquement différente du français et relativement peu diffusée et peu enseignée en Europe. Ainsi, cette conversation a donné lieu à 20 ans de recherche sur le rôle de l'*input* dans l'acquisition d'une langue étrangère.

La rédaction du mémoire pour l'obtention du diplôme d'HDR m'a permis de prendre le temps nécessaire pour organiser, décrire et analyser ce travail de 20 ans. Le but de cette synthèse en français est de souligner des éléments essentiels de mes recherches présentées en anglais dans le Volume I de mon mémoire d'HDR.¹ De manière générale, la présentation des résultats de mes études suit l'ordre chronologique de mes recherches. Ainsi, les travaux exposés dans mon mémoire correspondent aux études qui se réfèrent systématiquement aux résultats des études antérieures et aboutissent à de nouvelles hypothèses. Après chaque étude, la question suivante se pose : Que souhaitons-nous apprendre des prochaines études sur la première exposition à la langue cible (désormais LC) ?

Le document présenté en anglais commence, après une brève introduction, par le chapitre 1 où j'expose les théories d'acquisition en langue première et notamment celles qui ont inspiré les recherches sur l'acquisition des langues secondes (RAL).² Ensuite, je présente les théories, les modèles et les hypothèses les plus répandus dans la RAL. Le chapitre 2 décrit les quelques rares études sur l'*input* à partir de la première exposition à une nouvelle langue. En présentant mes propres études concernant les premiers stades d'acquisition d'une langue étrangère par l'apprenant adulte, je tente de comprendre les enjeux méthodologiques et théoriques. Le chapitre 3 présente le projet européen VILLA (*Varieties of Initial Learners in Language Acquisition: controlled classroom input and elementary forms of linguistic organisation*), qui se caractérise par une forte dimension interlinguistique et porte sur l'acquisition initiale du polonais dans un contexte institutionnel en situation contrôlée. Dans le but de confronter les travaux en acquisition des langues et ceux en didactique des langues, l'objet du chapitre 4 est d'explorer si et de quelle manière les résultats des études empiriques en acquisition des langues étrangères peuvent alimenter la réflexion didactique liée aux pratiques de classe de langue. Dans le chapitre 5 je conclus mon mémoire en résumant mes travaux et en montrant comment ils permettent d'éclairer mes recherches futures.

Mes publications que je cite dans le volume I sont réunies dans le volume II de mon HDR. Elles sont organisées par ordre chronologique, en partant des publications les

¹ Ayant reçu une offre par un éditeur anglophone pour une éventuelle publication destinée à la communauté internationale des chercheurs en acquisition et en didactique des langues étrangères, j'ai pris la décision de rédiger le mémoire en anglais.

² Je reprends la terminologie utilisée par Véronique (1992) (à la suite de Coste, 1992) : RAL (Recherche sur l'Acquisition des Langues secondes) fait référence aux recherches sur l'apprentissage, l'acquisition ou l'appropriation des langues secondes/étrangères.

plus anciennes aux plus récentes. D'autres travaux cités dans le volume I qui n'apparaissent pas dans le volume II, ont été présentés dans des colloques et sont, pour la plupart, en cours d'analyses plus approfondies et/ou en préparation pour des publications futures.

1. Approches théoriques et méthodologiques en acquisition des langues secondes

Partons de l'hypothèse de Chomsky mentionnée par Clive Perdue dans nos échanges initiaux. Qu'est-ce que cette hypothèse et quel est le cadre théorique adopté pour réfléchir à cette hypothèse ?

Nous pouvons identifier trois hypothèses qui cristallisent les débats en matière d'acquisition d'une langue seconde.

La théorie de Chomsky (1957, 1980) sur la faculté de langage s'inscrit dans l'approche générativiste et fait le postulat d'un mécanisme linguistique inné (Grammaire universelle) chez l'enfant. L'approche générativiste pour la recherche en acquisition des langues secondes repose sur l'hypothèse qui considère les productions des apprenants dans la LC (la langue étrangère en cours d'acquisition) comme des imitations imparfaites de celle-ci. Dans ce contexte, l'hypothèse la plus répandue suppose un transfert complet de toutes les structures syntaxiques (principes et paramètres) de la langue maternelle de l'apprenant vers la LC (Schwartz et Sprouse 1996). L'acquisition passe donc par une réinitialisation des paramètres de la langue maternelle pour permettre l'appropriation de ceux de la LC. L'*input* dans la LC ne fait que déclencher cette réinitialisation. Dans cette approche, les jugements de grammaticalité et les productions d'apprenants dans une LC sont comparés à ceux du locuteur natif idéal de cette langue.

À l'inverse, les théories émergentistes (en acquisition de la langue première et d'une langue seconde) posent, quant à elles, le principe selon lequel le système linguistique « émerge » de facteurs inter-corrélés (Ellis 1998). Pour l'essentiel, l'utilisation de la langue permet de mémoriser des constructions, ou plutôt, des schématisations forme-sens au moyen de mécanismes cognitifs généraux. Dans cette perspective, l'accent est mis sur l'*input* linguistique qui contient les informations nécessaires à l'acquisition de la langue. Les apprenants se basent sur la fréquence d'apparition d'un trait de langage dans l'*input* et sur les probabilités statistiques pour construire un nouveau système linguistique. La connaissance de la langue maternelle peut faciliter ce processus, mais ce n'est pas toujours le cas.

Enfin, le modèle des lectures des apprenants, une approche fonctionnaliste de l'acquisition des langues secondes, considère que la langue de l'apprenant est un système linguistique à part entière, et non une simple imitation imparfaite de la LC. L'apprenant construit un système de façon progressive, au fur et à mesure de son exposition à l'*input*. Lorsqu'il est confronté aux tâches communicatives, il émet des hypothèses sur le fonctionnement de la LC. Selon cette approche, la tâche du linguiste est d'observer et de décrire les variétés d'apprenants à différents moments

du développement, afin de mieux comprendre les processus et principes linguistiques qui entrent en ligne de compte dans l'acquisition. Tout comme la théorie de la grammaire universelle, cette perspective présuppose des universaux linguistiques. Ceux-ci sont cependant différents dans le sens où ils ne sont pas uniquement basés sur la syntaxe, mais aussi sur des principes sémantiques et pragmatiques de la structure informationnelle, et se développent à travers les interactions et la négociation conversationnelles en LC (Perdue 1993).

Cette dernière hypothèse recoupe celle des émergentistes essentiellement dans le postulat selon lequel une langue s'apprend en situation de communication, au moyen de l'interaction dans la langue à apprendre. Mes recherches s'inscrivent dans cette dernière approche et s'inspirent d'une étude menée au Max-Planck Institute of Psycholinguistics (MPI, Nimègue) sur les premières minutes d'exposition à la langue chinoise par des natifs néerlandophones (Zwitserlood et al. 1994/2000). Cette étude a mis en évidence la nécessité de mettre en place une étude ciblée sur l'*input* au tout début de l'acquisition afin de contrôler entièrement l'*input* fourni aux apprenants. Ceci est devenu la raison d'être de mes recherches.

Le chapitre 1 de mon mémoire traite des questions posées par l'étude de l'acquisition de la langue première (L1), d'une langue seconde (L2) et d'une troisième langue (L3).³ Voici les principales questions soulevées dans mon mémoire :

1. Quel est l'état initial de la L2/L3 et quel est le rôle de la L1 ?
2. Quelle est la nature de l'*input* linguistique et quel est son rôle durant le développement langagier chez l'apprenant ?
3. Dans les études empiriques portant sur l'acquisition d'une L2/L3, en quoi consiste l'*input* ?

En plus d'une présentation générale de la littérature relative aux trois questions précédentes, ce chapitre aborde le modèle du lecte de base (*Basic Variety*, Klein et Perdue 1992, 1997) proposé dans le cadre de l'approche des lectes des apprenants (Perdue 1993) pour les études sur la première exposition à la LC. C'est cette perspective qui donne un cadre à mes travaux depuis le premier grand projet de recherche que j'ai mené dans les années 90 (Rast 1998, 1999). Dans ce chapitre, la discussion entamée sert de tremplin à la description de l'ensemble de mes recherches dans le cadre de l'analyse des lectes des apprenants mais aussi à mes propositions de recherche à venir que je poursuivrai dans la même optique.

³ Bien que je désigne par « L3 » les langues étrangères apprises après la L2, cela englobe toute acquisition ultérieure d'une langue étrangère sans spécification d'un ordre chronologique (Rast 2008, 2010 mais également Hammarberg 2010 pour une discussion portant sur la terminologie). En outre, je traite les termes « langue seconde » et « langue cible » comme des synonymes étant donné que je n'entre pas dans le débat autour de l'usage de ces termes. De la même façon, je regroupe les termes « langue maternelle », « langue source » et « première langue » (L1), privilégiant ce dernier dans le texte.

2. Travaux antérieurs sur le stade initial de l'acquisition d'une langue étrangère

La raison pour laquelle j'étudie les premiers stades de l'acquisition tient en partie au fait qu'une théorie d'acquisition des langues secondes/étrangères doit expliquer comment les apprenants intègrent les caractéristiques d'une nouvelle langue à tous les niveaux de maîtrise, y compris au début de l'exposition à cette langue. J'étudie également les stades initiaux afin de pouvoir contrôler, observer et décrire l'environnement linguistique de l'apprenant (*l'input*) et de pouvoir le comparer à ses capacités de percevoir, comprendre et produire dans la LC. En d'autres termes, ce type d'étude me permet d'observer l'utilisation que les apprenants font de *l'input* en langue étrangère qu'ils reçoivent. Quand j'ai débuté dans ce domaine, le manque de recherches sur les premiers stades de l'apprentissage était manifeste. Or, depuis une dizaine d'années, les travaux de ce type sont de plus en plus nombreux. Ils apparaissent dans les publications sous le titre anglais *First Exposure Studies*. Mes travaux ainsi que les travaux menés à MPI sur des langues artificielles se sont inscrits dans ce nouveau champ de recherche et l'ont fait émerger.

2.1 La définition de l'étude de l'exposition initiale (« *First Exposure Studies* »)

Aucun cadre théorique précis ne vient limiter la recherche en RAL. Au contraire, il semble que pour faire progresser nos connaissances en matière de processus d'acquisition d'une langue étrangère, nous ayons besoin d'informations plus précises sur *l'input* linguistique auquel les apprenants sont exposés. Il en découle que dans les études de la première exposition à la LC, les données sont recueillies et enregistrées dès les premiers instants d'exposition à cette LC. De ce fait, les participants sont des apprenants confrontés pour la première fois à une nouvelle LC au moment du lancement de l'étude, comme indiqué dans Rast (2008 : 29): « La notion de « première exposition » renvoie aux études dont les données sont recueillies au moment du tout premier contact avec la LC et durant les premières secondes, minutes et heures suivant l'exposition, et dont *l'input* de la LC est entièrement contrôlé ». ⁴ C'est pourquoi le terme « première exposition » fait référence à une approche méthodologique et non à une théorie, un modèle ou une hypothèse spécifique. Les LC peuvent être naturelles ou artificielles. Les langues ont été étudiées sous leur forme écrite et orale. ⁵ La performance de l'apprenant dans les tâches en LC est mesurée de multiples façons en ce qui concerne l'« exposition » : 1) au moment de la toute première exposition à la LC ; 2) après les premières secondes, minutes ou heures d'exposition à la LC ; 3) après un nombre contrôlé d'expositions à

⁴ « The 'first exposure' designation applies to studies in which data are collected from the very first moment of contact with the TL and within the first seconds, minutes and hours of subsequent exposure, and in which all TL input is controlled. »

⁵ L'étude du geste a également été intégrée en tant que critère dans la recherche portant sur la première exposition à la langue cible (Gullberg, Roberts & Dimroth 2012). Je n'ai pas connaissance d'études portant sur la première exposition à la langue des signes.

une sélection d'items de la LC ; ou 4) par une combinaison des éléments précédents. La performance de l'apprenant est testée par divers moyens tels que la décision lexicale, la reconnaissance des mots, les jugements de grammaticalité, la répétition de phrases, la compréhension par image et d'autres tâches de production ainsi que par le biais d'expériences psycholinguistiques et de mesures de l'activité neurolinguistique. Le chapitre 2 fait état d'une sélection d'études portant sur la première exposition à la LC qui répondent à ces critères.

2.2 Les travaux sur le stade initial et le rôle de l'*input* dans la RAL

Des discussions sur le rôle de la L1 et sur l'*input* de la LC dans la RAL donnent lieu à de nouvelles études sur les premières étapes de l'acquisition d'une LC, notamment en ce qui concerne le rôle de l'exposition à la LC et les processus par lesquels les apprenants en extraient des informations. Les chercheurs de ce domaine essaient également de comprendre le rôle que joue le type d'enseignement employé en classe. Une telle étude nécessite un examen attentif de l'*input* auquel les apprenants sont exposés. Bien que, pour ce faire, les langues artificielles aient été utilisées (Hulstijn et DeKeyser 1997), peu d'études ont tenté de le faire en utilisant l'*input* d'une langue naturelle principalement à cause de la difficulté à contrôler, à mesurer, à coder et à documenter l'environnement linguistique de l'apprenant.

Récemment, plusieurs séries d'études commencent à explorer les différentes manières d'observer et d'analyser les premières étapes de l'acquisition d'une langue étrangère avec un contrôle total de l'*input* de la langue naturelle. Dans ce qui suit, j'expose les projets sur les étapes initiales les plus élaborés à l'heure actuelle.

Dans une recherche menée à l'Université de Calgary dans une approche générativiste, les participants sont entraînés à l'*input* naturel de la LC (allemand) lors de leur première exposition. Cette recherche a pour but d'analyser un nouveau paradigme expérimental qui évalue la rapidité avec laquelle les apprenants segmentent les mots et les associent à une signification. Dans ce paradigme, les participants apprennent des mots dans l'*input* et le nombre d'expositions est soigneusement contrôlé afin d'observer l'effet de ces expositions sur l'apprentissage des mots. L'étude mesure également la rétention en mémoire en procédant à un nouveau test au bout de deux semaines sans exposition à la LC. Les résultats révèlent un apprentissage rapide après une faible exposition. Concernant les mots transparents, cet apprentissage était à l'évidence facilité par les connaissances lexicales de la L1. En ce qui concerne les mots opaques, l'apprentissage révèle une capacité impressionnante de la part des apprenants à extraire de nouveaux sons à partir du flux sonore et à les associer à de nouveaux mots après seulement deux expositions (Carroll 2012, 2013, 2014). Ces résultats démontrent l'existence d'un mécanisme linguistique efficace qui ne requiert qu'une exposition limitée à la LC.

Tout comme mes recherches, une série d'études a été menée dans l'approche fonctionnaliste à l'Institut Max Planck de psycholinguistique à Nimègue (Gullberg,

Roberts et Dimroth 2012; Zwitserlood et al. 1994/2000) en étant basée sur de très petites quantités d'*input* de langue entièrement contrôlé. Dans ces études, les participants n'ayant aucune connaissance du chinois étaient exposés à un enregistrement vidéo de 7 minutes en langue chinoise (un bulletin météo). Les participants à la première étude, des néerlandophones natifs, devaient regarder une vidéo sans avoir reçu aucune consigne ni suivi aucune formation. Suite à seulement huit expositions, une série de tâches réalisées après les expositions a révélé que les participants intégraient certaines informations relatives aux mots et aux significations de la nouvelle langue lorsque ceux-ci étaient accompagnés de gestes (Gullberg, Roberts et Dimroth 2012). Une autre étude au cours de laquelle les participants étaient exposés à la même vidéo en chinois a révélé que les participants néerlandophones pouvaient reconnaître des mots et extraire des contraintes phonotactiques et même comprendre le sens de certains mots après seulement 7 minutes d'exposition (Gullberg et al. 2010). Ristin-Kaufmann et Gullberg (2014) ont utilisé le même enregistrement vidéo en chinois avec des groupes de germanophones suisses. Ils ont également constaté que 7 minutes suffisaient aux participants pour généraliser leur nouvelle connaissance phonétique afin de mettre de côté les non-mots en chinois. En résumé, cette recherche montre le rôle majeur de l'apprentissage implicite lors des premières étapes de l'acquisition d'une langue chez l'adulte, au moins pour les processus nécessitant l'extraction d'informations à partir d'un flux continu d'une langue naturelle, à l'instar de la reconnaissance des mots.

Mon propre travail se base sur une série d'études visant à observer des apprenants en situation guidée pendant les cours de langue, c'est à dire dans un cadre où l'*input* linguistique peut être entièrement contrôlé. J'ai piloté un projet à l'Université de Paris 8 en collaboration avec Marzena Watorek, Clive Perdue et d'autres membres de l'UFR Sciences du langage, rapporté dans mon DEA (Rast 1998), qui avait pour but d'établir des hypothèses à tester lors de mes recherches doctorales. Également en étroite collaboration avec Marzena Watorek, j'ai recueilli des données qui m'ont servi à rédiger ma thèse de doctorat. Par la suite, nous avons mené plusieurs projets pour affiner nos recherches.⁶

Nos projets menés à l'Université de Paris 8 portant sur l'acquisition de la LC polonaise par des francophones natifs s'intéressent aux facteurs qui aident les apprenants à assimiler les mots et les structures de la LC lors de la première exposition et dans les heures qui suivent. Deux facteurs étudiés de façon approfondie sont la fréquence d'un item dans l'*input* et sa transparence par rapport à la L1.

Un des résultats principaux présenté dans ma thèse de doctorat et dans mon livre publié en 2008 (Rast 2008) est d'avoir identifié le rôle majeur des formes

⁶ Ces recherches ont reçu des soutiens financiers de l'UMR 7023 *Structures Formelles du Langage* et du *Programme d'Aide à la Recherche Innovante* (2011-2012), Université Paris 8, St.-Denis, France.

transparentes lors de l'apprentissage des mots. Bien que ce résultat ne nous surprenne pas, le processus qui permet de l'atteindre est important. Ces recherches nous ont permis d'identifier des éléments linguistiques spécifiques qui jouent un rôle dans l'apprentissage des mots, tels que des propriétés phonétiques et phonologiques de la LC. Nous avons pu montrer qu'en fait, la « transparence » d'un item considérée de façon générale ne veut pas dire grande chose en soi. Il faut prendre en compte ce que l'apprenant perçoit comme similaire ou différent entre un élément de la L1 et son équivalent dans la LC. Il s'agit précisément de la « psychotypologie » des langues établie par l'apprenant même (Kellerman 1979, 1980).

Afin de pouvoir cerner la manière dont la transparence joue dans le traitement des nouveaux mots, il faut tout d'abord regarder comment elle est mesurée. Dans toutes nos études sur l'acquisition du polonais, les mots présentés dans les cours font partie de deux ou trois catégories : mots transparents, mots peu transparents et mots opaques. Ce classement a été fait suite à un test de transparence effectué avant la préparation du cours de polonais auprès de locuteurs natifs monolingues⁷ des L1 considérées dans nos travaux⁸ n'ayant jamais été en contact avec le polonais. Le test consistait à traduire à l'écrit dans leur L1 les mots polonais entendus en se basant sur une potentielle familiarité avec les mots de leur L1. Ainsi, nous avons pu constituer une catégorie de noms transparents que les locuteurs ont pu traduire correctement du polonais sans aucune connaissance préalable de cette langue. À titre d'exemple, un item comme *francuz* (« français ») est considéré comme transparent dans la mesure où il a été correctement traduit par au moins 50 % des locuteurs natifs des 5 langues. En revanche, un mot polonais comme *lekarz* (« médecin ») est considéré comme opaque.

Il s'avère que Rast et Dommergues (2003) ont démontré que le rôle des formes transparentes était particulièrement important dans les tâches de répétition de phrases, souvent en interaction avec d'autres facteurs qui ont, eux aussi, contribué aux processus de perception et de compréhension des apprenants, notamment l'accent lexical, la distance phonémique entre des sons de la L1 et la LC et la position du mot dans l'énoncé. Par la suite, avec ma collègue Ellenor Shoemaker (Shoemaker et Rast 2013), nous avons confirmé le rôle majeur de la transparence dans l'extraction des mots à partir d'un flux sonore lors de cette étape préliminaire. Enfin, dans une étude menée avec plusieurs collègues (Rast et al. 2014), nous avons constaté que les avantages de la transparence jouent un rôle important également dans d'autres tâches telles que les jugements de grammaticalité, mais pas dans

⁷ J'utilise le terme « monolingue » en rapport avec « bilingue » suivant le travail de Grosjean (1982) qui définit le bilinguisme comme l'utilisation régulière de deux ou plusieurs langues ou dialectes dans la vie de tous les jours. Il s'ensuit que les « natifs monolingues » dans nos études n'utilisent qu'une langue de façon régulière dans la vie de tous les jours.

⁸ Dans le cas de VILLA, ceci comprend les 5 langues sources, français, allemand, néerlandais, italien et anglais ; seulement deux catégories ont été retenues pour le projet VILLA, mots transparents et mots opaques.

toutes les tâches. Les résultats démontrent des effets irréguliers lors de la production du marquage flexionnel sur les noms.

En ce qui concerne la fréquence, la méthodologie a évolué au fur et mesure de nos études. Lors des premières études, un item est considéré comme « fréquent » dès lors qu'il apparaît plus de 20 fois dans l'*input*, « rare » dans les cas où l'item lexical apparaît 1 à 20 fois, ou « absent ». Afin de mieux contrôler ce phénomène, le projet VILLA a établi d'emblée une catégorie de mots que l'enseignant devait utiliser de façon fréquente et systématique durant les séances successives échelonnées sur les 14 heures. Ainsi, les mots fréquents correspondent aux items employés au moins 20 fois dans l'*input*. D'autres items sont, soit complètement absents de l'*input*, soit utilisés avec une fréquence très faible.

Les premières études (Rast et Dommergues 2003 ; Rast 2008) montrent que la fréquence n'a pas un effet immédiat sur les répétitions de phrases mais seulement après 8 heures d'exposition, à l'issue desquelles les items fréquents étaient répétés plus fidèlement que les items moins fréquents. Dans l'étude de Shoemaker and Rast (2013), celle-ci n'a aucun effet dans la résolution de la tâche de reconnaissance des mots après 6,5 heures d'exposition à la langue polonaise. En revanche, avec le même groupe d'apprenants, un effet de fréquence a été observé dans les jugements de grammaticalité (à l'oral) où la flexion des items fréquents est reconnue par les apprenants avec un degré d'exactitude plus élevé que dans le cas des items absents de l'*input*. Ce résultat souligne l'importance d'obtenir des informations précises à propos du rôle des différents facteurs dans des processus spécifiques, tels que la perception par opposition à la compréhension, ou la compréhension par opposition à la production.

Un autre résultat à souligner est que nos études ont montré que les apprenants étaient sensibles à la morphologie lors de la première exposition (par ex. Rast 2006), une découverte importante au vu de l'hypothèse dominante avancée dans les travaux portant sur l'acquisition d'une L2. Cette hypothèse suggère que les apprenants prêtent rarement attention à la morphologie flexionnelle, de même qu'ils la remarquent, la traitent et l'utilisent peu. Ces résultats ne démontrent pas nécessairement que les apprenants utilisent ces formes correctement vis à vis de la LC en question, cependant, ils sont la preuve que les apprenants travaillent sur les formes. Par conséquent, nous souhaiterions en apprendre davantage sur la façon dont se réalise ce travail sur les formes. Pour cela, nous avons besoin d'études interlinguistiques qui nous permettent de différencier les effets de la L1 des autres effets. Cela nécessite également des données d'observation sur une plus longue période de temps, en particulier pour les questions de recherche portant sur la production et le discours de l'apprenant.

Encore une fois, ces études montrent le rôle complexe de l'*input* de la LC qui nécessite des recherches approfondies afin de mieux comprendre comment les apprenants analysent l'*input* reçu. Les études consacrées aux premiers stades

d'exposition à la LC ont largement contribué aux données empiriques, aux analyses et aux interprétations pour la recherche sur les premières étapes de l'acquisition des langues étrangères. Elles ont également montré qu'il est possible de mesurer l'*input* d'une langue naturelle en dépit d'obstacles méthodologiques qui pourraient paraître insurmontables. Cependant, ces études restent peu nombreuses, elles utilisent souvent les mêmes variables de différentes façons et font appel à diverses combinaisons de L1-LC pour explorer un champ large de phénomènes linguistiques qui ne sont pas nécessairement confirmés par d'autres études pertinentes. Il est difficile de généraliser leurs résultats car ces études sont rarement, voire jamais, répétées. Aussi utiles qu'elles soient, en ce qui concerne nos connaissances sur les processus psycholinguistiques et cognitifs qui interviennent dans l'appropriation de la langue, ces études, y compris les nôtres, n'ont fait qu'effleurer la surface des questions portant sur le traitement initial de l'*input*. Sans doute, notre contribution majeure était plutôt de nature méthodologique. C'est pour cela qu'avec les collègues européens, nous avons uni nos forces en développant un projet interlinguistique qui permet non seulement de contrôler l'*input* dans un contexte institutionnel, mais aussi d'introduire des variables contrôlées dans l'étude de l'acquisition de la même LC par des locuteurs de 5 langues sources différentes. L'objectif du projet VILLA est de nous informer sur les processus et leur évolution dans le temps. Ce projet présenté dans le chapitre 3 du volume I est synthétisé dans la section ci-dessous.

3. Le projet VILLA

Le projet VILLA (*Varieties of Initial Learners in Language Acquisition: Controlled classroom input and elementary forms of linguistic organisation*)⁹ dont le financement a été obtenu en 2011 dans le cadre de l'appel *Open Research Area* (ORA) est le résultat de la série d'études sur l'*input* que j'ai menées à Paris 8 avec mes collègues entre 1996 et 2010 (cf. section 2) ainsi que des travaux qui se sont déroulés dans les mêmes années à MPI aux Pays-Bas. Ce projet s'ouvre à des comparaisons interlinguistiques systématiques de manière similaire au projet ESF (Perdue 1993).

Le projet VILLA se base sur un grand corpus qui résulte de l'enseignement de la même langue, le polonais dans un cours de 14 heures dans des conditions où des apprenants des 5 langues maternelles différentes (français, allemand, néerlandais, anglais et italien) sont exposés à un *input* comparable. Un tel corpus permet d'identifier clairement les phénomènes qui sont issus de l'influence de la L1, de l'impact de la LC, et de mettre en évidence ce qui relèverait de l'impact des principes

⁹ Le projet VILLA a démarré le 1^{er} juin 2011 et a duré 36 mois grâce à une subvention ORA (*Open Research Area in Europe for the Social Sciences*) pour un montant de 625 861 € (ANR – France ; DFG – Allemagne ; NWO – Pays Bas). L'équipe britannique et l'équipe italienne ont demandé des financements supplémentaires pour se joindre au projet, ce qui donne un budget total du projet de 764 515 €.

dictés par la faculté du langage humain (principes universels). Le projet VILLA cherche à déterminer si les catégories que construisent les apprenants au stade initial sont imperméables à certaines propriétés des langues maternelles ou cibles, et, le cas échéant, à quelles propriétés. L'identification de ces propriétés mènera à de nouvelles hypothèses plus approfondies sur la faculté du langage humain.

3.1 Le projet VILLA : questions traitées par la recherche

Nous avons identifié plus précisément trois questions importantes pour les acquisitionnistes, les didacticiens et les enseignants de langues :

- 1) Quel est le rôle de la/des langue(s) source(s) dans le processus d'appropriation d'une nouvelle langue ? Quelles connaissances linguistiques antérieures aident l'apprenant dans la perception, dans la compréhension et dans la production en langue étrangère ? Comment ces connaissances interagissent-elles avec les caractéristiques de la LC présentée dans un cours de langue (*l'input* ou l'entrée linguistique) ?
- 2) Comment les apprenants s'acquittent-ils de différentes tâches de production plus ou moins guidée ? Quelle influence le type de tâche peut-il avoir sur la production des formes correctes en LC ?
- 3) Est-ce que la présentation explicite des règles de grammaire aide réellement à comprendre le fonctionnement de la LC et à se l'approprier ? Existe-t-il des connaissances linguistiques qui seraient plus facilement acquises grâce à la simple mise en relief des formes enseignées lors d'un cours de langue étrangère ?

3.2 Le projet VILLA : la méthodologie

Afin de répondre aux questions ci-dessus, le projet s'est donné des moyens méthodologiques pour : 1) observer le parcours d'acquisition qui débute au niveau zéro de connaissances en LC dans les 14 premières heures d'exposition ; 2) étudier le traitement de *l'input* (correspondant ici à tout ce que les apprenants reçoivent pendant le cours de polonais) dans différents domaines (perception, compréhension, analyse grammaticale et production) en relation avec ses caractéristiques (type de structures grammaticales et d'items lexicaux, leur fréquence et la manière de les présenter pendant le cours) ; 3) examiner le rôle des connaissances initiales de l'apprenant (adulte ou enfant) dans le traitement de *l'input* : le rôle des caractéristiques typologiques de la langue source (dimension interlinguistique) ainsi que le rôle des principes universels propres au langage et à la communication.

Le corpus VILLA offre une documentation complète des séances d'enseignement du polonais, des acquis des apprenants ainsi que de leurs profils individuels. Il donne ainsi la possibilité d'examiner avec précision des séquences didactiques en relation

avec les comportements des apprenants, les interactions mutuelles entre apprenants et avec l'enseignant. La mise en parallèle d'une part de l'analyse de ces séquences didactiques et du déroulement des cours réalisés avec deux démarches didactiques différentes et d'autre part des résultats des tests que les apprenants ont effectués en polonais, permettra d'affiner la réflexion autour des questions concernant tant les théories d'acquisition d'une L2 que l'apport de la recherche sur l'acquisition en didactique des langues.

Dix groupes d'apprenants dans cinq pays européens comprenant la France, l'Allemagne, les Pays-Bas, l'Angleterre et l'Italie (deux groupes dans chaque pays) ont été exposés à un cours d'initiation au polonais assuré par un enseignant de langue maternelle polonaise, recruté spécialement pour cette expérimentation. La méthodologie d'enseignement préconisée s'appuie pour l'essentiel sur les principes de l'approche communicative : les contenus linguistiques sont introduits en fonction de différentes situations de communication et en relation avec les actes de parole qui les définissent. L'enseignant utilise des dialogues pour introduire différents éléments linguistiques. Cependant, certains principes adoptés sortent du cadre strict de l'approche communicative. Ainsi, l'*input* fourni est exclusivement monolingue et l'enseignant n'utilise pas la L1 des apprenants.

En dehors de cette ligne de conduite générale en matière de méthodologie d'enseignement, dans chaque pays (sauf en Allemagne) deux groupes distincts d'apprenants présentant le même profil (âge, niveau d'instruction, type d'études, etc.) ont été soumis à deux types de cours de langue polonaise, différenciés par le degré d'explicitation des formes grammaticales abordées par l'enseignant. Ainsi, un groupe a reçu un enseignement basé sur le sens (*meaning-based input*, MB) et l'autre, un enseignement davantage axé sur la forme (*form-based input*, FB), le contenu des cours restant le même. Les groupes d'apprenants ayant suivi des cours de type FB avaient accès à des supports visuels où les formes enseignées étaient soulignées et regroupées selon les paradigmes grammaticaux. Dans ce type de cours, l'enseignant a procédé à une correction plus systématique et axée sur la forme, ce qui n'était pas le cas dans les cours de type MB. Cependant, aucune explication métalinguistique n'a été fournie, tous les cours étant entièrement assurés en polonais. En effet, le niveau initial de l'apprentissage ne permettait pas d'utiliser la LC pour les explications grammaticales. En revanche, l'équipe allemande a constitué deux groupes d'apprenants différents, l'un composé de jeunes adultes, l'autre d'enfants âgés de 10/11 ans, tout en gardant le même type de démarche, celle basée sur le sens (MB). L'approche allemande a été pensée pour pouvoir évaluer le rôle de l'âge dans l'acquisition initiale.

Chaque groupe d'apprenants a bénéficié de 2 semaines de cours de polonais composées de 9 séances de 1 h 30 (soit 90 minutes) et d'une dernière séance d'une quinzaine de minutes, ce qui correspond à 14 heures de cours au total. Dans chaque pays, l'ensemble des cours a été filmé par deux caméras (l'une orientée vers l'enseignant et l'autre vers les apprenants) et a été enregistré avec un enregistreur

numérique multipistes de haute qualité technique, équipé de 20 microphones, un pour chaque apprenant, et d'un microphone sans fil pour l'enseignant. Ainsi, nous disposons non seulement de l'image qui documente chaque séance et des enregistrements de la parole du professeur, mais également des enregistrements audio de toutes les interventions durant les séances avec chaque apprenant.

Les apprenants de tous les groupes ont été testés soit avant, soit après les séances successives avec différentes tâches permettant de documenter pendant la période d'observation le développement de leurs acquis en termes de perception, de compréhension et de production. Ils ont été soumis (à plusieurs reprises pendant la période des cours) à ces tests en polonais avec pour objectif d'évaluer leurs capacités dans différents types de traitement allant de la perception de la LC jusqu'aux premières productions plus ou moins guidées. Ainsi, les tests se répartissent en fonction du domaine linguistique ciblé : phonologie, lexicale, morphologie, syntaxe, discours. Comme pour nos études préalables, deux propriétés de l'*input* ont été contrôlées lors de l'étude : la transparence et la fréquence d'un « mot » dans l'*input*.

Les membres du projet VILLA ont conçu des tâches dans des domaines linguistiques variés, telles que des tâches de perception (par ex. discrimination phonémique et reconnaissance lexicale), des tâches de compréhension (par ex. vérification d'image) et des tâches de production (par ex. construction de deux types de discours : indications d'itinéraire et récit à partir d'un clip vidéo).¹⁰ Au total, les apprenants ont été soumis à 11 tâches différentes. Certaines tâches ont été répétées plusieurs fois pendant les 14 heures de la période du recueil de données, tandis que d'autres n'ont été effectuées qu'une seule fois.

3.3 Le projet VILLA : quelques résultats

La base de données qui en résulte comporte des enregistrements audio et vidéo de 14 heures de cours de polonais pour deux groupes de 15-20 étudiants dans chaque pays (en tout, 176 apprenants et environ 140 heures d'*input* de polonais fourni par l'enseignant). Ces enregistrements audio et vidéo contiennent les productions des 176 apprenants durant les cours de polonais, 25 tests de polonais et 11 tests psychométriques des différences individuelles pour chaque participant. Ces données sont aujourd'hui disponibles pour être analysées.

¹⁰ J'ai collaboré avec d'autres membres du projet VILLA en France et dans d'autres pays pour réaliser les tâches suivantes : *Transparency*, *Word Recognition* (extraction des mots à partir des phrases entendues), *Grammaticality Judgment* (jugements des déclinaisons entendues dans des phrases courtes), *Oral Question-Answer* (productions à l'oral de phrases courtes en répondant à une question), *Picture Verification* (compréhension à l'oral), *Sentence Puzzle* (test écrit de mise en ordre des mots). Je coordonne les analyses sur les variables de la transparence et de la fréquence ainsi que celles à partir des tâches de *Grammaticality Judgment*, *Word Recognition* et *Sentence Puzzle*.

Certains résultats sont particulièrement parlants. Prenons par exemple Hinz et al. (2013), qui présentent une analyse comparative des résultats de deux groupes d'apprenants (adultes allemands et français) sur des tâches de jugement de grammaticalité et de production en polonais que j'ai créées au fil des années en collaboration avec Marzena Watorek. Selon notre hypothèse, les apprenants germanophones seraient favorisés par rapport aux apprenants francophones par le fait que la morphologie nominale, absente en français, existe en allemand. Cette hypothèse est confirmée lors de la première passation de la tâche de jugement de grammaticalité après 4,5 heures de cours de polonais, les germanophones ayant répondu avec un taux d'exactitude plus élevé que les francophones. Lors de la deuxième passation, après 10,5 heures de cours, les francophones rattrapent les germanophones et les groupes atteignent un score élevé de 80% de réponses correctes. La L1 semble jouer un rôle moins important en ce qui concerne la production de la morphologie nominale. Bien que les apprenants germanophones obtiennent de meilleurs résultats en production aux deux intervalles (après 4,5 heures et encore après 10,5 heures) que les apprenants francophones, la différence entre les deux groupes n'est pas statistiquement significative. L'étude montre, encore une fois, que l'importance de la L1 varie selon la tâche, c'est-à-dire selon le type de compétence sollicitée, dans ce cas le jugement contre la production.

En ce qui concerne l'effet de la fréquence dans ces deux tâches, les analyses montrent pour les deux groupes d'apprenants que la production d'un mot marqué par une désinence appropriée augmente dans le cas des mots fréquents dans le cours. En revanche, la fréquence d'un mot n'a pas d'effet significatif sur le taux de réponses correctes dans le test de jugement de grammaticalité. Il s'avère que la fréquence peut là aussi jouer un rôle différent selon les compétences sollicitées.

Les résultats sur la transparence sont particulièrement surprenants. Bien que les résultats des deux groupes montrent un bénéfice de la transparence lors de la tâche de jugement, les phrases construites avec des mots transparents ayant les meilleurs scores, ce n'est pas le cas lors des productions. Pour les deux groupes, l'effet de transparence est significatif mais ceci est dû à une meilleure production des mots opaques que des mots transparents. Deux interprétations peuvent être proposées pour ce résultat. D'une part, on pourrait stipuler que les apprenants, dans un premier temps, focalisent leur attention plus sur les mots opaques et déduisent les règles à partir de ces items. Les mots transparents demandent moins d'attention, étant considérés en général comme connus. D'autre part, il est probable que pour apprendre un mot opaque, l'apprenant saisit le radical et la désinence comme une unité non analysée et la produit correctement. En revanche, dans le cas d'un mot transparent, le sens du radical étant compris, la désinence doit être analysée séparément. Une telle analyse demande probablement plus d'exposition à l'*input* et donc plus de temps pour qu'on puisse voir son résultat dans les productions des apprenants.

Une autre étude menée dans le projet VILLA par van Bergen, Shoemaker et Rast (2014) analyse les performances des apprenants adultes allemands, français, italiens et néerlandais dans une tâche de reconnaissance de mots (*word recognition*). Ce test, programmé sur le logiciel E-prime, vise à comprendre comment et à quel moment de l'apprentissage les items lexicaux sont reconnus dans un flux sonore. Les apprenants entendent une phrase en polonais suivie d'un mot isolé. Ils doivent dire si « oui » ou « non » le mot se trouve dans la phrase entendue. Les mots isolés soumis au jugement font partie d'une des 4 catégories suivantes : items lexicaux transparents/fréquents, transparents/absents, opaques/fréquents et opaques/absents. Ce test permet donc d'examiner comment la fréquence et la transparence d'un mot participent à son extraction d'un flux sonore. Le test de reconnaissance de mots a été effectué 3 fois : une première fois avant le début des cours, soit à 0 heures d'exposition au polonais (T0), une deuxième fois après 7,5 heures de cours (T1) et finalement une troisième fois après 13,5 heures de cours (T2).

À T0, lorsque les apprenants n'ont pas encore été exposés au polonais, le score des germanophones est considérablement moins bon que celui des autres groupes. Par ailleurs, on constate une différence significative entre l'extraction des mots transparents et des mots opaques chez les italophones et les francophones. Ces apprenants bénéficient plus de la transparence d'un mot que les germanophones et les néerlandophones, chez qui cette différence n'est pas observée. Ces résultats demandent d'autres analyses, notamment celle des caractéristiques phonotactiques des mots cibles (règles de combinaison des phonèmes pour former des syllabes), en relation avec les caractéristiques des équivalents allemands et néerlandais des mots transparents, qui pourraient être responsables de la différence entre les apprenants de L1 romane (l'italien et le français) d'une part, et de L1 germanique (l'allemand et le néerlandais) d'autre part.

À T1 et T2, dès que les germanophones reçoivent de l'*input*, leur score s'améliore et rejoint celui des autres groupes en dépassant le score des francophones. On observe également une forte influence de la transparence et de la fréquence des mots dans l'*input* pour tous les groupes d'apprenants. Ce résultat montre que les connaissances de la L1 jouent un rôle important dans la rapidité et l'efficacité du traitement du flux sonore de la LC. De plus, il montre l'importance de la régularité de l'exposition à une LC pour extraire efficacement des lexèmes d'un flux sonore, ce qui ne surprendra probablement pas les enseignants de langue. C'est toutefois un résultat important pour les théories de l'acquisition, dont certaines n'accordent qu'un rôle minimal à la quantité et à la fréquence de l'exposition aux données linguistiques de la nouvelle langue (Schwartz et Sprouse 1996 ; Carroll 2013).

Bien que les résultats déjà disponibles éclairent surtout la manière dont l'apprenant analyse une nouvelle langue au cours de l'acquisition, cette base de données nous permettra également d'observer l'effet des démarches didactiques mises en œuvre par le projet VILLA et par l'enseignant du polonais afin d'aider les apprenants à

analyser l'*input* linguistique en les conduisant à une appropriation rapide et efficace d'une langue étrangère.

4. L'interface entre l'acquisition et la didactique d'une langue étrangère

Comme susmentionné, l'interface entre la recherche sur l'acquisition d'une langue et l'enseignement des langues, avec une attention particulière pour l'apprenant, a toujours revêtu un intérêt spécial pour moi au cours de mes divers enseignements et travaux de recherche. Comme le montrent les collaborations fructueuses entre les membres du projet VILLA et les enseignants de langues (voir Rast et Watorek 2014 ; Watorek et Rast 2016 ; Watorek, Durand et Rast 2016), les questions relatives à l'acquisition qui ont guidé mes recherches depuis mon projet de DEA jusqu'au projet VILLA sont aussi pertinentes pour la pédagogie. De mon point de vue, les deux sont complémentaires. L'objectif de la recherche sur l'acquisition de la langue est de comprendre et de décrire les processus sous-jacents qui interviennent dans le développement des connaissances linguistiques, c'est-à-dire, ce que l'apprenant fait pour s'approprier une nouvelle langue, en tenant compte des divers domaines de l'analyse linguistique, de la perception à la production. La recherche en didactique, par ailleurs, a pour but d'identifier, de développer et d'utiliser (à travers l'enseignement) les outils et méthodes les plus appropriés et les plus bénéfiques pour un apprentissage des langues efficace et optimal.

4.1 Acquisition des langues secondes en milieu guidé

Au sein du domaine de la RAL, on distingue désormais l'acquisition des langues secondes en milieu guidé (*Instructed Second Language Acquisition, ISLA*). Loewen (2015 : 2) en donne par exemple la définition suivante : « un champ de recherche fondé sur des bases théoriques et empiriques visant à comprendre comment la manipulation systématique des mécanismes ou des conditions d'apprentissage permet ou facilite le développement et l'acquisition d'une langue autre que sa langue maternelle ». ¹¹ L'approche *ISLA* pose notamment deux questions fondamentales : comment la RAL peut-elle contribuer à aider les professeurs à être plus efficaces ; et comment peut-on améliorer les méthodes utilisées pour l'enseignement des langues étrangères ?

L'approche des lectures des apprenants, davantage ancrée dans la conception traditionnelle de l'acquisition des langues que dans l'approche *ISLA*, soulève une

¹¹ « a theoretically and empirically based field of academic inquiry that aims to understand how the systematic manipulation of the mechanisms of learning and/or the conditions under which they occur enable or facilitate the development and acquisition of a language other than one's first. »

question légèrement différente : comment les apprenants adultes traitent-ils l'*input* pour développer leurs compétences langagières ? C'est cette question qui, en définitive, relie les théories et les études empiriques sur l'acquisition des langues (dans ce cas, la description et l'étude de l'*input* et de son traitement par les apprenants) à la pratique de l'enseignement des langues étrangères. Fondamentalement, que peuvent apprendre aux enseignants les découvertes sur le traitement efficace de l'*input* reçu par les apprenants ? Il y a quelques décennies, Corder (1967) a souligné l'importance de cette approche lorsqu'il a suggéré que les apprenants sont dotés d'« un programme d'apprentissage inné » (« *built-in syllabus* ») et a recommandé d'appréhender la langue depuis leur point de vue, en tenant notamment compte des erreurs qu'ils commettent.

Si le projet VILLA est unique par sa méthodologie, il s'inscrit naturellement dans le type de « recherches en salle de classe », ou de recherches sur l'« acquisition des langues secondes en milieu guidé », ne serait-ce que parce que l'étude de l'apprentissage de la langue est réalisée dans un contexte d'enseignement. Le projet se rapproche également de l'approche *ISLA* par la similitude des questions auxquelles il tente de répondre.

Les principaux points étudiés sont les suivants :

- 1) L'effet de l'enseignement axé sur la forme (*Focus on Form*) ou sur les formes (*Focus on Forms*) et celui de l'*Input Enhancement*.

Le projet VILLA aborde cette question en étudiant les effets des variables formelles dans la mise en évidence (*enhancement*) textuelle de l'*input* axé sur la forme (*form-based*, FB).

- 2) Les corrections

Dans le cadre du projet VILLA, l'approche adoptée par l'enseignant s'intéresse au rôle des différents types de corrections sur le développement de la compétence linguistique dans les groupes recevant un cours de type FB et ceux recevant un cours de type axé sur le sens (*meaning-based*, MB).

- 3) La distinction entre enseignement/apprentissage implicite et explicite.

La méthodologie du projet VILLA est conçue, en partie, pour observer les différences potentielles dans les résultats des apprenants en fonction des conditions d'*input* (MB et FB). En particulier, les résultats issus des données sur la production des apprenants sont susceptibles de nous éclairer sur cette distinction.

4.2 *L'interface entre l'input en salle de classe et la distinction entre la connaissance, l'apprentissage et l'enseignement implicites et explicites*

Tout le monde semble s'accorder sur le fait que l'enseignement des langues a une visée éducative, ce qui implique une intention de la part de l'enseignant d'aider ses apprenants à acquérir des connaissances. L'enseignant a donc besoin de savoir quels

types de connaissances sont importants concernant la LC et comment aider au mieux ses élèves à les assimiler. Loewen (2015 : 15) soulève cette question importante : « Si l'enseignement vise à transmettre un type particulier de connaissances sur la L2, comment les théories et les recherches sur l'acquisition des langues peuvent-elles nous aider à atteindre cet objectif ? ». ¹²

L'éducation implique aussi la participation des élèves. Dans le cas de l'enseignement des langues étrangères, les niveaux de motivation peuvent varier au sein des apprenants, mais, fondamentalement, ils débutent leur apprentissage avec des connaissances et des systèmes déjà établis (leur L1 et, éventuellement, d'autres langues étrangères). Ces connaissances préalables, y compris la connaissance de la L1, se doivent d'être étudiées en parallèle avec le type spécifique de connaissances sur la langue à enseigner.

Dans l'introduction d'un article dressant un aperçu de la connaissance implicite et explicite de la langue, N. Ellis (2007 : 119) résume les enseignements des neurosciences concernant cette distinction :

[...] l'apprentissage implicite et l'apprentissage explicite obéissent à des processus distincts, l'être humain possède des systèmes de mémoire implicite et explicite séparés, il existe différents types de connaissances langagières, stockées dans différentes régions du cerveau, et les types de connaissances acquises dépendent du type d'enseignement reçu. ¹³

Cette description est relativement simple et semble constituer le point de départ de la plupart des chercheurs qui s'intéressent à la connaissance, à l'apprentissage et à l'enseignement implicites et explicites. Ces trois domaines, étroitement liés entre eux, ont fait l'objet de nombreuses études durant les dernières décennies.

Parmi les distinctions entre implicite et explicite, la plus controversée concerne l'*apprentissage*, car le cadre théorique dans lequel chacun s'inscrit influence fortement sa conception de ces définitions (Hulstijn 2005). Fortement liée à la distinction entre la connaissance implicite et explicite, cette controverse est au sein des recherches en acquisition des langues (L1 et L2), comme j'ai pu le montrer dans le premier chapitre de mon mémoire.

En revanche, la question de la distinction entre *enseignement* explicite et implicite est en lien étroit avec les débats qui ont lieu en didactique des langues concernant l'enseignement axé sur le sens et l'enseignement axé sur la forme. De façon générale, la littérature sur l'acquisition en milieu guidé utilise la définition de DeKeyser (1995) de l'enseignement explicite : une sorte de règle à laquelle on pense au cours

¹² « If the goal of instruction is a specific type of L2 knowledge, what can SLA theory and research tell us about the best ways to achieve these goals? »

¹³ « ...that implicit and explicit learning are distinct processes, that humans have separate implicit and explicit memory systems, that there are different types of knowledge of and about language, that these are stored in different areas of the brain, and that different educational experiences generate different types of knowledge. »

du processus d'apprentissage. L'enseignement implicite, à l'inverse, vise à permettre aux apprenants de déduire inconsciemment les règles (R. Ellis 2005). Cela ne signifie pas pour autant que l'enseignement implicite ne cherche pas à inciter l'apprenant à prêter attention à la forme.

Comme le soulignent de Graaff et Housen (2009) dans leur analyse de l'enseignement implicite et explicite axé sur la forme, la différence fondamentale est la suivante : dans un cas, l'enseignant « dirige » l'attention de l'apprenant sur la forme, tandis que dans l'autre, il « attire » simplement son attention sur celle-ci. L'enseignement explicite « dirige » cette attention en ce qu'il incite les apprenants à se concentrer sur les formes et à s'en former des représentations mentales conscientes, avec ou sans l'utilisation de métalangage. Cette approche est connue en didactique comme démarche grammaticale inductive et explicite, qui consiste à faire découvrir et verbaliser la règle sous-jacente à partir de l'exemple. L'enseignement implicite vise, quant à lui, à « attirer » l'attention des apprenants sur les exemples de formes linguistiques qui apparaissent dans l'*input* communicatif, mais ne cherche pas à développer une conscience ou une compréhension des « règles » qui les décrivent.

Concernant cette même distinction, R. Ellis (2005) a montré que les différents types de tâches font appel aux connaissances explicites et implicites séparément, ce qui confirme la nécessité d'améliorer notre compréhension de cette distinction. Il a également constaté que les apprenants ont tendance à mieux réussir dans les tâches explicites que dans les tâches implicites et que l'enseignement explicite conduit à une maîtrise plus rapide et plus précise des structures. Ces résultats corroborent ceux de deux méta-analyses très citées (Norris et Ortega 2000; Spada et Tomita 2010) qui révèlent que, généralement, les traitements explicites produisent de meilleurs résultats que les traitements implicites.

Bien que de nombreuses questions demeurent, une tendance générale se dessine dans la littérature concernant le rôle de l'implicite et de l'explicite dans l'enseignement des langues étrangères. Les recherches indiquent que la méthode d'enseignement la plus efficace consiste à faire interagir et communiquer les apprenants en contexte en se focalisant sur le sens, tout en fournissant des indications sur les structures et les propriétés de la LC. C'est justement l'approche adoptée par le projet VILLA pour l'enseignement du polonais. En fait, dans les deux cas, l'*input* était fondé sur la communication avec une attention particulière pour le sens, et des informations sur les structures de la LC étaient fournies. La différence entre les deux conditions (MB et FB) tient à la quantité d'informations fournies sur les structures de la LC et à la façon dont elles étaient présentées.

Dans le chapitre 4 de mon mémoire, suite à une présentation sur l'interface entre l'acquisition et la didactique des langues étrangères, j'expose quelques propositions d'actions concrètes à réaliser en classe. Elles se fondent sur les résultats de recherches présentés dans le mémoire, notamment ceux du projet VILLA et ses

précurseurs, et répondent aux analyses critiques des suggestions de chercheurs en RAL dont les paradigmes de recherche sont aussi bien émergentistes que générativistes.

La première proposition concerne le rôle de l'association entre son et sens dans le processus d'apprentissage de la langue parlée, un domaine qui mérite notre attention. En effet, si l'on considère l'importance des sons dans la langue parlée, il semble raisonnable de supposer que la maîtrise du système phonologique de la LC par l'apprenant lui permettra de mieux communiquer dans cette langue. Deux tâches de réception menées en polonais dans le cadre du projet VILLA, la discrimination des phonèmes (*Phoneme Discrimination*) et l'extraction d'un mot (*Word Recognition*), ont fourni des résultats qui commencent à vérifier cette hypothèse (Shoemaker & Rast 2014 ; van Bergen, Shoemaker & Rast 2014). Ces résultats indiquent 1) qu'avec certaines combinaisons L1-LC, les apprenants assimilent deux phonèmes de la LC à un phonème de la L1, entraînant une incapacité à faire la distinction entre deux phonèmes de la LC, et 2) que la transparence aide les apprenants à extraire les mots du flux sonore nouveau. Le premier point confirme les travaux bien connus de Flege (1995) et Best (1995) sur le développement phonétique en L1 et en L2. En ce qui concerne le deuxième point, les mots transparents ont tendance à contenir des phonèmes communs à la L1 ou à au moins une des langues étrangères de l'apprenant (Carroll 2004 ; Rast 2008 ; Rast et Dommergues 2003). La difficulté à extraire des mots opaques pourrait être due, au moins en partie, à la nature des catégories et combinaisons phonémiques nouvelles et inconnues auxquelles sont confrontés les apprenants. La plupart du temps, lors de l'apprentissage initial des langues, les apprenants entendent des sons qu'ils n'ont tout simplement jamais entendus auparavant. C'est le cas de tous les apprenants en polonais du projet VILLA.

La deuxième proposition porte sur les premiers résultats obtenus sur les effets des deux conditions d'*input* lors des tâches de réception. Ces résultats tendent à soutenir les démarches pédagogiques qui mettent l'accent sur les différences de propriétés structurelles, notamment dès les tout premiers stades. Watorek, Rast et Hilton (2011), par exemple, ont montré que mettre l'accent sur les propriétés structurelles de l'*input* pouvait avoir un effet bénéfique. Cependant, avant de se lancer dans cette approche, il serait particulièrement intéressant de consacrer de futures études aux analyses des données de production de VILLA en salle de classe afin de voir si elles permettent d'arriver à la même conclusion.

Latos (à paraître), par exemple, a mis en évidence des effets du type d'*input* sur le comportement de l'enseignant en classe ainsi que sur les résultats des apprenants. Elle a mené une analyse approfondie des formes flexionnelles de l'item lexical polonais *ulic-* (« rue ») utilisées lors de cours destinés aux francophones dans les groupes d'enseignement basé sur le sens (MB) et sur la forme (FB). Elle s'est intéressée en particulier aux terminaisons morphologiques utilisées par l'enseignante dans ses utilisations de l'item *ulic-* et aux utilisations des apprenants

de toutes les formes de l'item *ulic-* dans la tâche « indications d'itinéraire ». Les résultats tirés de la comparaison des deux types de cours (MB et FB) ont révélé que la répartition des terminaisons rattachées à *ulic* était plus variée dans le cours de type FB que dans le cours de type MB. L'enseignante n'a pas utilisé plus de flexions dans le cours de type FB, mais a fait un usage régulier d'une plus grande variété de terminaisons, notamment le nominatif, le locatif, l'accusatif et l'instrumental. Dans le cours de type MB, elle a utilisé toutes les formes susmentionnées, mais la forme nominative prédominait nettement.

Bien que les cours de polonais de types MB et FB aient été conçus pour enseigner les mêmes flexions, le fait d'avoir mis l'accent sur la forme semble avoir influencé l'enseignante dans son utilisation concrète de cette forme. Il est possible que la forme nominative, souvent considérée comme la forme par défaut dans l'approche théorique des lectures des apprenants, ait été considérée comme la plus simple à assimiler. Les résultats de la tâche de production ont révélé que les apprenants du groupe FB ont utilisé des terminaisons différentes plus souvent et de manière plus régulière que ceux du groupe MB. Cela semble montrer que le cours de type FB a « poussé » les apprenants à sortir de leur zone de confort et à expérimenter d'autres formes que la forme par défaut.

Cette différence dans les types de cours et les résultats des apprenants constitue une découverte importante. Il apparaît qu'une approche axée sur la forme a une influence non seulement sur l'appropriation du cours par l'apprenant mais aussi sur l'intégralité du cours donné par l'enseignant. Une telle découverte confirme l'importance d'une description précise de l'*input* de façon à pouvoir le comparer à certains aspects de la performance de l'apprenant, ceci en vue de mieux comprendre comment les apprenants transforment leur *input* en *intake*, un système linguistique qui devient ensuite disponible pour être utilisé en tant que production (*output*).

La base de données issue du projet VILLA comprend des tâches de production, mais également l'*output* produit par les apprenants (productions orales) durant les leçons de polonais. La transcription, le codage et les analyses des productions des apprenants seront capitales pour la compréhension des stades élémentaires de l'organisation du nouveau système linguistique et pour l'avancée des aspects pratiques et de leurs applications dans les salles de classes. Si les enseignants sont conscients des connaissances qui peuvent être attribuées aux apprenants au stade initial d'une L2/L3, notamment s'ils connaissent les langues connues par leurs élèves, ils peuvent les utiliser pour passer de façon plus efficace au niveau supérieur (Lüdi 2011).

5. Bilan et perspectives futures

Les études sur les premières étapes de l'acquisition d'une nouvelle LC commencent à donner une idée plus précise de ce que les apprenants adultes sont capables de faire à ce stade très précoce. Comme le supposait l'approche des lectures des

apprenants, ces derniers ne s'appuient pas uniquement sur leur L1, mais extraient des informations du signal vocal et les utilisent pour créer des formes sonores pouvant être reconnues et associées à une signification. Les apprenants identifient également des modèles dans l'*input*, ce qui les aide à reconnaître les éléments comme appartenant à la LC. Ces formes identifiées peuvent ensuite être analysées pour en tirer des informations grammaticales et être utilisées dans les premières productions. Toute activité langagière, depuis la perception de sons et l'extraction de mots du flux sonore jusqu'à l'association de ces formes sonores à une signification et à l'apprentissage des informations grammaticales, est nécessaire au développement d'un nouveau système morphosyntaxique.

Le projet VILLA, ainsi que d'autres études sur les premières étapes de l'acquisition d'une LC, continuent à se pencher sur les questions que cela soulève. Ils contribuent également aux bases de données disponibles pour de futures recherches empiriques. Pour le moment, les études sur les premières étapes de l'acquisition d'une LC confirment que les apprenants adultes ont des capacités qui sont souvent ignorées par les chercheurs en RAL et les enseignants de langue. De telles études n'affirment pas seulement que la captation de cette activité est possible, mais suggèrent également que la compréhension de ces premiers stades pourrait être cruciale pour comprendre le processus dans son intégralité.

Une telle conclusion alimente également le doute par rapport aux hypothèses proposées en RAL à la suite des travaux de Chomsky sur la grammaire universelle. Le travail que fait l'apprenant à partir du flux sonore de la LC exige une interaction de capacités multiples en lien avec des représentations phonologiques, morphologiques et syntaxiques. Il ne suffit pas de proposer un transfert complet de la L1 vers la L2 pour expliquer l'acquisition d'une nouvelle langue, ce que font Schwartz et Sprouse (1996). Il faut plutôt décrire ce que fait l'apprenant face à un *input* linguistique et face à une tâche à accomplir en LC, comme le propose l'approche des lectures des apprenants. C'est ainsi que nous allons pouvoir comprendre les processus de développement d'une nouvelle langue à apprendre.

L'ensemble des données recueillies dans le cadre du projet VILLA ouvre la voie à un grand nombre de projets de recherche dans le futur. Je souhaite en particulier étudier de manière plus approfondie les effets de la fréquence et de la transparence sur les résultats des apprenants et les données relatives à la production des apprenants en classe et à la variabilité individuelle. En outre, je poursuivrai mes recherches sur l'interface entre l'acquisition et la didactique dans mon propre enseignement de l'anglais en tant que L2/L3 (selon Rast, accepté).

En ce qui concerne la variable « fréquence » dans le projet VILLA, les analyses effectuées jusqu'à présent se sont principalement concentrées sur les fréquences des mots préétablies dans l'*input* et sur leur effet sur un ensemble de tâches. Les résultats obtenus jusqu'à aujourd'hui contribuent à notre compréhension de cette variable dans l'acquisition précoce d'une langue étrangère. Cependant, nous ne

serons capables de comprendre complètement comment la fréquence entraîne la productivité lors des premiers stades qu'en analysant le nombre de contextes différents où apparaît un élément linguistique (*type frequency*) et la relation entre ce nombre et les fréquences d'occurrence de cet élément (*token frequency*). Effectuer des recherches plus approfondies sur la fréquence des formes morphologiques nominales dans l'*input* polonais m'intéresse tout particulièrement. Un système de codage permettant de calculer ces fréquences a été mis au point, permettant d'effectuer des analyses assez rapidement. Une fois les fréquences établies, des analyses plus poussées des performances des apprenants lors de tâches spécifiques, telles que la tâche de jugement de grammaticalité (marquage casuel) et la tâche de production (*Oral Question-Answer*), seront réalisées.

Les données relatives à la production des apprenants en classe permettront d'effectuer une comparaison entre les productions des apprenants et celles de l'enseignant, tout en étudiant les corrections, les réponses des apprenants aux corrections, et leurs performances ultérieures sur les tâches en polonais. C'est dans cette étude qu'intégrer des informations provenant des tests de différences individuelles semble le plus fascinant. Analyser les données relatives aux productions des apprenants en classe ouvre la voie à des études de cas individuelles, qui ouvrent elles-mêmes la voie à une étude portant sur un ensemble d'apprenants par rapport à leurs résultats durant les cours de polonais (dans les conditions d'*input* des cours de type MB et FB), leurs performances lors des tâches en polonais et leurs profils en termes de mesure des différences individuelles. Une telle étude fournira le lien nécessaire entre la RAL et la didactique dans l'apprentissage des langues. Enfin, dans une perspective plus large, d'autres études basées sur le modèle du projet VILLA ont déjà commencé et semblent bien parties pour continuer.

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Foreign Language Learning and Teaching: From first exposure to first productions

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Introduction

My experience working in Applied Linguistics and Teaching English to Speakers of Other Languages (TESOL), including teaching English in intensive English programs and training language teachers, introduced me to the field of second language acquisition (SLA) where important questions in both language teaching and teacher training were being addressed. My desire to understand the processes of language learning led me to pursue my DEA and PhD in Linguistics with a specialization in SLA. I was particularly interested in the relationship between what teachers “teach” their students and what their students “take away” from this teaching. I came to understand that two particularly relevant constructs within the field were linguistic “input” and “intake” and that the relationship between them, more specifically, the relationship between the input that the teacher provides and the aspects of this input that learners take in (intake), was still unknown. To study this relationship fully, the input to the learner would need to be controlled from the very beginning, that is, from the moment of first exposure to the language being learned. This led me to a project that involved the study of input in a language other than English for the simple reason that English is omnipresent in today’s society; finding participants who had never been exposed to English (at least in France) would be difficult if not impossible. Polish was selected as the target language of the project largely because I was based in France where finding French speakers with no prior exposure to Polish is possible, and because little research had been conducted on the learning of Polish as a foreign language. Moreover, Polish is typologically different from French in a number of interesting ways allowing for hypotheses to be tested relative to the native language of French participants. Studying under Clive Perdue within the functionalist – Learner Varieties (LV) - framework, I soon became aware of the potential importance of not only the input and the intake for the learning process, but also the “output”, that is, the learner’s use of his or her learner variety in target language contexts.

The field of SLA strives to “understand” how language learning works. This understanding sheds light on the human mind and the relationship between language and cognitive processes, such as the role of memory in language comprehension. This understanding about how language learning works, and more specifically how the teacher’s input influences learning and what input is most useful, efficient and effective, is important for the development of language teaching. Teachers, especially those working with beginning learners, will benefit from knowing what the starting point of learning a foreign language looks like and when, under what conditions and how their input in the classroom can affect change. Teachers need to know what kind of input is most effective in order to create it and help students work with it. Finally, to properly guide students and

help them be efficient in their own learning, teachers need to know what students are capable of doing with the input and how they can best interact with the input, pushing it to convert to intake that can be used as output, which in turn serves to strengthen the intake necessary for language acquisition to occur.

At times, SLA research findings shed light on the acquisition of a specific language, such as English or Polish, or a specific language type, such as agglutinative or tonal languages. At other times, results reveal processes that are not specific to any given language and appear to be universal. In the latter case, we gain an understanding of SLA processes regardless of the source or target language combination. These issues are at the core of the LV approach to SLA (Dimroth & Starren 2003; Hendriks 2005; Perdue 1993), the research paradigm that has framed my work for two decades. My project on the role of the input in the acquisition of Polish at the early stages grew out of the discovery of the Basic Variety (BV), a simple linguistic system developed independently of source and target language properties by adult immigrants in response to the need to communicate in their host environment (Klein & Perdue 1992, 1997). The importance of the input lies in the BV as revealed in the findings of several extensive research projects conducted on the BV data (Perdue 1993), studies that continue to examine how learners analyze and negotiate the input in order to communicate as needed in their daily lives (e.g. Bernini 2000; Perdue 1996a, 2000). My prior research (Rast 2008) within the LV framework has confirmed the important role that linguistic input plays in developing foreign language systems, as has other recent SLA research (e.g. Piske & Young-Scholten 2009; Véronique 2010).

This focus on the importance of the input is not banal given that input has often been described as “negligible” in research paradigms where the language faculty is prioritized. As mentioned above, however, we cannot be satisfied with the basic notion that “input matters” (Piske & Young-Scholten 2009). Questions still remain as to the precise role of the input and its convergence with factors such as the learner’s first language, other known languages, a human language faculty, cognition, input conditions (e.g. instructed vs. non-instructed; more or less focused on form), individual differences, and interaction. In order to fully understand the role of the linguistic input in foreign language acquisition, the input needs to be disentangled from at least some of these factors. The best way to do this is to observe the input from the very beginning, an approach taken by recent “first exposure” studies (described in Chapter 2). Two steps are considered essential for the success of these studies: 1) the real input to the learner must be described; 2) the learners’ performance relative to the input must be described. Depending on the methodology, data may be made available for analyses of native language effects, individual differences, and/or the role of a language faculty, to mention a few.

Finally, this document is of a theoretical, empirical and applied nature. Chapter 1 begins with an overview of research in first language acquisition (FLA) to provide context for the discussion of second/third/foreign language acquisition that follows. In a second part, the chapter continues with an overview of prominent theories of SLA that contribute to our thinking about the early stages of foreign language acquisition. Third (subsequent) language acquisition research is incorporated into the discussion as well. The focus of the chapter is on theoretical assumptions, all of which are based on empirical studies conducted within a particular theoretical framework. Given that my work is on the early stages, I do not provide a detailed discussion of empirical findings of these theories across all levels of acquisition; rather, I describe a selection of empirical first exposure results in Chapter 2.

Chapter 2 provides an overview of the essential questions and research conducted in the area of first exposure to a foreign language. Although this specialized area of research in SLA is recent, studies are now being conducted and findings reported on a regular basis, including my own studies that served as pilots to a larger cross-linguistic study of learner varieties at the initial stages of foreign language acquisition, the source of my most recent research. Empirical findings are reported in this chapter and, when viewed together, they offer new insights into SLA theory and methodology.

Chapter 3 introduces the first exposure project *Varieties of Initial Learners in Language Acquisition: Controlled classroom input and elementary forms of linguistic organisation* (VILLA) mentioned in the previous paragraph and describes the research questions, methodology, and results thus far. The VILLA project has been my principal research focus since 2011, upon reception of a European grant by the VILLA research team.¹ The grant period has now ended, but the project is alive and well, as will be evidenced by the information presented in this document. Chapter 3 closes with a brief analysis of language acquisition theories relative to first exposure studies and in particular the VILLA project research questions and results.

Chapter 4 addresses the issue of how our growing knowledge about how individuals learn a foreign language can be applied to the field of language pedagogy. The chapter provides a brief summary of reports about the relation between language learning and teaching, such as the role of explicitness in teaching and learning, as identified by language acquisition specialists, language

¹ The VILLA project is a empirical research project coordinated by Marzena Watorek and Rebekah Rast in France, Christine Dimroth in Germany and Marianne Starren in the Netherlands. It associated Leah Roberts and Henriëtte Hendriks in the United Kingdom, as well as Giuliano Bernini and Marina Chini in Italy. The project started on 1 June 2011 and lasted 36 months. It was supported by a grant from ORA (Open Research Area in Europe for the Social Sciences) across three granting agencies, ANR in France, DFG in Germany, and NWO in the Netherlands. The British Academy and a PRIN grant supported the English and Italian teams. Additional

pedagogy specialists and language teachers. Although suggestions about addressing these questions are provided, the information in this chapter remains quite speculative and is meant to provide fodder for future research.

Chapter 5 provides a final summary and critical analysis of my research thus far and presents possible avenues for future research.

Chapter 1

Theories and Models of Language Acquisition: The Early Stages

Introduction

The objective of this chapter is to provide the reader with a brief overview of language acquisition theories and models that are in some way relevant to research on first exposure to a novel second/foreign language and initial language development in the field of second language acquisition (SLA).² This overview will provide the basis for the remainder of this document in which I will justify my choice of theoretical framework, describe my past and present research within this framework, highlight the contribution of this work to the field of language acquisition, and address the future development of my research.

Numerous models and theories of language acquisition have been proposed to explain how children and adults of all ages learn to communicate in not only one, but often two or more languages. While the sheer number of models can be daunting for the young researcher, it shows the wealth of the field and underlines the multitude of disciplines that have influenced language acquisition research, from philosophy and linguistics to psychology and physics. To make sense of these numerous theories and their common points and differences, I will borrow from Tomasello and Abbot-Smith (2002), who, more directly than most, reduced the number of paradigms in the modern study of child language acquisition to only two: generativist theory and single-process theory, the latter based on theories in Cognitive-Functional Linguistics (otherwise known as “usage-based” theory, e.g. Bybee 1985, 1995; Goldberg 1995; Langacker 1987). MacWhinney (2010, 2015) applied this dichotomy to second language acquisition theory, identifying two principal approaches: Universal Grammar (UG) and emergentism.³ Over time, I have come to agree, to a certain extent, with this straightforward distinction for language acquisition research, while also recognizing the variety of hypotheses and claims within each of these two paradigms.

² My use of second language acquisition (SLA) refers to the research field. When referring generally to the languages being acquired by adult learners I use the term L2 or TL acquisition. At times, I acknowledge the important distinction to be made between L2 and L3 acquisition, in which case I employ terms proposed in the third language acquisition literature, namely L3 or additional/subsequent languages (but see Hammarberg, 2010 for other proposals). The terms “acquisition” and “learning” are used interchangeably for the most part in this document in that Krashen’s (1982) distinction is not particularly relevant here. In Chapter 4, where it is at times relevant, the distinction may be made.

³ Hulstijn (2015) notes a similar distinction for theories of L2 development: generative and usage-based.

Given that child language acquisition research is a precursor to the field of SLA, this chapter begins with theories in first language acquisition (FLA) that are particularly relevant to SLA theorizing. A brief description of theories of SLA and the application of FLA theory to SLA follows, as do occasional sections on third language (L3) acquisition theories where the distinction between L2 and L3 acquisition is useful. Although child L2 acquisition research has recently produced a plethora of studies, I have chosen to restrict the sections on L2 and L3 acquisition to language acquisition in adults only.⁴ Theories will be addressed within the context of research questions about input processing during language learning, and specifically those that are pertinent for the study of the early stages of foreign language acquisition.

1.1 First Language Acquisition: Theories and models relevant to first exposure research in Second Language Acquisition

1.1.1 A brief history of language acquisition research

The underlying questions in FLA are essentially the following: How is it that children at a very young age learn to interpret and produce utterances in the language they hear around them? Is their grammatical knowledge innate or constructed over time? Do their grammatical systems interact with other linguistic and cognitive systems or are they independent? What role does the linguistic input play in the development of a child's linguistic system?

Although philosophers have addressed these and related questions for centuries, the origins of the scientific study of FLA can be found more specifically in the disciplines of psychology (child development), anthropology and modern linguistics. In the late 19th century, many child development researchers kept diaries of their own children's general development (Wright 1960). These case studies often included extensive observations of language development, setting the stage for further discussion and development of appropriate tools to investigate child language development. Following these initial observations, studies on children's vocabularies became an area of focus, with researchers examining the size and content of vocabularies, as well as sentence length, at various ages (see Clark 2003 for an overview).

Simultaneously in the late 19th century, the Reform Movement in language teaching inspired a scientific approach to the study of language. Particularly in the area of phonetics, research came to fruition in the form of pamphlets, articles and books on the sound systems of language (e.g. Passy 1886; Sweet 1874). This interest grew out of one of the basic principles of the Reform Movement, the

⁴ See Dimroth and Haberzettl (2012) for a recent study of child L2 acquisition conducted within the learner varieties approach, and Unsworth (2016) for a recent study on input effects in early child L2 acquisition.

primacy of speech (Howatt 1984). One of the leaders of the movement, Viëtor (1882), argued that reform of classroom language instruction needed to begin with accurate descriptions of speech based on the science of phonetics. A second reason for reform was the focus on connected text as the core of the teaching-learning process. A new form of grammar study, especially for the purposes of teaching English, was developed (e.g. Sweet 1892).

With this focus on linguistics in the teaching profession, it is not surprising that in the 20th century, we begin to witness the development of a scientific approach to the elements of language and its acquisition that went beyond the study of language for the purpose of teaching. In Europe, Ferdinand de Saussure's identification of synchronic vs. diachronic dimensions of language, as well as his recognition of language as an interrelated system of elements, inspired the program that became known as "structural linguistics" (Saussure 1995 [1916]), often referred to as the starting point of modern linguistics in Europe. In the late 1920s, building on Saussure's work, Jakobson and colleagues founded the Prague Linguistic Circle, later known as the "Prague School", comprised of European structuralists who developed linguistic functionalism, an approach to the study of language that views the functions performed by elements of language to be fundamental to understanding linguistic processes (Kučera 1983). Roman Jakobson (1960), and Jakobson and Halle (1956), contributed to the establishment of phonological distinctive features and the identification of functions of language deemed necessary for communication, such as context, emotion and metalinguistics. The focus on "function" is essentially in contrast to the focus on "form" as the term is used in formal linguistic theory, an approach that would soon influence much language acquisition research.

In North America, anthropological and linguistic accounts of indigenous languages became a source of attention (e.g. Boas 2002 [1911]), and soon after in 1924, Edward Sapir (1921) and Leonard Bloomfield (1933) founded the Linguistic Society of America. Bloomfield went on to adopt behaviorism as a framework for linguistic description with a view to making linguistics autonomous and scientific. His study aimed at identifying the rules and/or principles that governed the permissible combinations of phonological and syntactic units of languages. Meaning was secondary. Bloomfield's approach inspired Zellig Harris's (1951) work on grammatical description, which in turn inspired Noam Chomsky, Harris's student (Lyons 1970). With Chomsky's publication of *Syntactic Structures* in 1957, transformational generative grammar, a precursor to what is now referred to as "Universal Grammar", was born. Chomsky (1959) diametrically broke any presumed ties with behaviorism in his critical review of Skinner's (1957) book *Verbal Behavior*. In 1965, he posited the "innate predisposition of the child to develop a certain kind of theory to deal with the evidence presented to him" (Chomsky 1965: 26) and introduced the notion of a "language-acquisition device" (32). It wasn't long before the focus

of what can now be called “language acquisition research” shifted to sentence structure and syntactic analysis, a research program pursued in North America under Chomsky’s influence.

At the same time, however, psychologists, such as Roger Brown and Dan Slobin, were also contributing significantly to research on FLA through extensive investigations of child language. Brown’s observational study of the development of English in three children, Adam, Sarah and Eve, revealed the extraordinary value of recording and analyzing the spontaneous speech of a child and mother in conversation. The study inspired Brown’s (1973) book, which reports stages of development in English-speaking children, a valuable resource in the documentation and analysis of language in interaction. Slobin (1967, 1985a, 1985b) took a cross-linguistic approach, focusing on comparative studies of language phenomena and language processing. Following methods of analysis used by anthropologists, both scholars were pioneers in developing the tools and techniques needed to analyze language development data. They produced models to examine language data for what they actually are, rather than as deviations of a target language norm. These models provided important inspiration for much research in SLA as we will see later in this document. Child language development researchers continue to use the methods developed by Brown and Slobin, among others, and to expand on them as they pursue the question of how children learn to use their ambient language (see Clark 2009 for an overview). This approach is often referred to as “empiricist”, in contrast to “nativist” (Valian 2014), and one that later led to the development of the “emergentist” perspective in language acquisition theorizing and methodology. In what follows, we examine FLA theories through the lens of several related questions that are also relevant for our discussion of SLA:

1. What is the initial state in FLA?
2. What is the nature of the linguistic input, and what role does it play in child language development?
3. What does the input actually look like in empirical studies of FLA?

1.1.2 What is the initial state in FLA?

As mentioned above, two clear research paradigms, Universal Grammar (UG) and emergentism, stand out in theories and methodologies addressing how a child learns language. The distinction between these two paradigms is in most part due to distinct claims about the initial state of language acquisition, that is, what a child brings to the task of learning language and constructing a grammar. Valian (2009: 15) frames the question around the notion of “content” (referred to as “knowledge” by some theorists). She poses the question, “Does the mind have any content prior to experience?” In the UG or “nativist” perspective, the response is positive; it assumes an innate mechanism for syntactic structures (Chomsky 1965) and views this mechanism as “content” or “knowledge” about

language. Tomasello (2000: 247), on the other hand, points out that children, no doubt, are “biologically prepared to acquire a natural language in any number of ways involving basic processes of cognition, social interaction, symbolization, and vocal-auditory processing”, but this biological preparation is not viewed as “content”. O’Grady (2008a: 449) supports this latter perspective, insisting that emergentism does not oppose “nativism” per se: “the fact that the brain is innately structured in various ways is simply not a matter of dispute”. Emergentists, however, do refute the central tenet of UG claims, that is, innate linguistic constraints on the computational system for language. Emergentists opt rather for a starting point in which “...the linguistic system is constructed from non-linguistic parts” (O’Grady 2008a: 449). In sum, whereas the UG perspective posits language-specific content in the mind prior to experience in the form of an innate mechanism, emergentists posit a brain that is biologically ready to receive and develop language. What then are the implications of these perspectives on models of the initial state?

1.1.2.1 Universal Grammar: the initial state in FLA

The goal of syntactic theory and the proposed UG framework is to provide a model of native speaker linguistic competence, that is, a model of what native speakers unconsciously know about their languages, a genetic blueprint that determines what grammars can look like (Chomsky 1965). The special ability of human brains to master a natural language led Chomsky to propose an innate mechanism, a language “organ” or “faculty” dedicated to language. This innate language faculty contains the child’s knowledge of linguistic rules, constraints and principles, claimed to be linguistic universals found across languages. Chomsky named this innate knowledge “Universal Grammar”. It is this knowledge (or “content”) that constitutes the “initial state” of a child’s language faculty. Regardless of the language to which a child is exposed, the child brings this innate knowledge to the task of learning a language and as such, does not need to “learn” this information (White 2003).⁵

Valian (2009) identifies two main types of linguistic universals within the UG framework: absolute (true for all languages) and relative (those that differ from language to language). Absolute universals, also known as “invariant principles” or “formal” universals, are those that are generally true for all languages (Chomsky 1981; Goodluck 2007; White 2003). Valian (2009: 21-22) provides an example, arguing that, “All overt pronouns in every language have case”. She demonstrates how even if case marking is largely absent on English pronouns, data from English grammatical and ungrammatical sentences show that case is grammatically present. In the ungrammatical sentence, “Lee considered she to be

⁵ Proposals about generative grammar and UG have evolved over time. As this discussion is beyond the scope of the current manuscript, I address the reader to Jackendoff’s (2011) thorough overview of theories about the human language faculty.

happy”, English speakers “know” that the position following the verb when filled by a noun or pronoun requires objective case. For this reason they recognize that “Lee considered she to be happy” is ungrammatical and “Lee considered her to be happy” is grammatical. They “know” this because of the absolute universal, “All overt pronouns have case”.

Relative universals are those that differ from language to language. Two types can be identified: 1) syntactic features and categories, and 2) parameters (Chomsky 1981).⁶ The former, often referred to as “substantial” universals (Goodluck 2007; Valian 2014), are the building blocks of syntax, an inventory of possibilities, such as the categories Noun, Verb, Adjective, from which the child will select on the basis of the ambient input. Not all languages use all features and categories. For example, the future in English is expressed by the modal “will”, not by a morphologically-marked future form of the verb. Parameters, the other type of relative universals, are assigned values; the parameters themselves are universals, but the values differ across languages.⁷ Word order is a well-known parameter for which values may differ. In English, for example, basic constituent word order is SVO, whereas in Japanese it is SOV, and in Irish Gaelic VSO.

From a UG-based perspective, therefore, the initial state is the state of the child’s mind intact with absolute and relative universals for language acquisition, the “knowledge” with which the child comes to the task. This knowledge will “give the child a head-start in analyzing the input, steering her away from a multitude of logically possible, but grammatically impossible, hypotheses about the structure of her language” (Goodluck 2007: 47). Through interaction with one’s childhood language, what Chomsky calls “primary linguistic data”, the child develops a new body of knowledge about a specific language. The child’s job, then, is to select the appropriate features and categories and set the appropriate parametric values for the items detected in the linguistic input (White 2003). It is during this selection process that language acquisition will take place.

1.1.2.2 Emergentism: the initial state in FLA

Numerous proposals exist within research identified with or related to emergentism, two prominent ones being a “processor-based” model (O’Grady 2005) and “usage-based” models (see Ellis 2008 for an overview). Although other models may not be explicitly associated with emergentism, they offer explanations about language that correspond to the emergentist perspective. These models, which will be discussed at appropriate points in this chapter and the next, include, but are not limited to, connectionism (e.g. Bates & MacWhinney

⁶ Although Chomsky’s minimalist program did away with parameters, many language acquisition researchers continue to make use of this notion (but see Lardiere 2009).

⁷ Lardiere (2009) proposed replacing the metaphor of parameter-setting to one of features and functions. This will be discussed in the following section on UG perspectives in SLA.

1987; Elman et al. 1996), constructionist models (e.g. Goldberg 2006), functionalist/interaction approaches (e.g. Chenu & Jisa 2009; Hickmann, Hendriks & Roland 1998; Jisa et al. 2010; Kail & Hickmann 1992; Morgenstern 2009), dynamic/complex systems models (e.g. van Geert 2008, 2010), as well as models based on statistical probabilities (e.g. Saffran, Newport & Aslin 1996).

With respect to the first language (L1) initial state, the “emergentist” proposal that offers the most radical account of the child’s mental system is O’Grady’s (2003, 2005) “processor-based” emergentism, a modular model of language acquisition. Unlike traditional syntactic theory, however, O’Grady (2005: 2) denies the existence of a so-called “blueprint” or “architecture” of sentence structure. Rather, he writes, “Put simply, when it comes to sentences, there are no architects; there are only carpenters.” Carpenters design as they go and make use of available materials as they build. Efficiency is the driving force behind this creation and the eventual functioning of the human language computational system, the use of operations on words to form sentences. Two systems are involved: the lexicon (information about the symbols of the language) and the computational system (combinatorial mechanisms that lead to sentence formation). In O’Grady’s view, syntax and processing are closely linked. However, he suggests that there is no grammar - no categories or principles that are exclusively grammatical -, and he attributes responsibility for language acquisition to an “efficiency driven processor” (12). Such a processor is necessary to explain the processing of sensory input. The linguistic phenomena present in the sensory input, according to O’Grady, can be understood as operations on symbolic representations or approximations, but their properties are not attributed to autonomous grammatical principles as assumed by generative-based theories. In other words, the computational system builds the representations through processing of the input, so the theory of sentence structure is subsumed under the theory of sentence processing. O’Grady (2005: 161) places his model within the emergentist program as follows:

The emergentist theory makes a two-fold claim. First, grammar in the traditional sense is unnecessary. And, second, the computational system proposed to deal with the phenomena [...] is just an efficiency driven linear processor. That is, it builds sentences from left to right one word at a time, resolving dependencies at the first opportunity so as to ease the burden on working memory.

With regard to cognition, O’Grady (2008a: 456) explains, “The cognitive mechanism underlying acquisition is simply a processor – in fact the very same processor that is responsible for forming sentences in real time during actual language use”. Like other emergentists, O’Grady views language as gradually “emerging” in children “through the repeated processing of sentences that they encounter in the speech of others” (456). This view highlights the importance of the linguistic input to which children are exposed, while also claiming that input

is not simply a trigger for language acquisition, but rather, the primary material needed for the processor (the carpenter) to do its job (to build a system).

Although other emergentist-based researchers do not necessarily posit a “processor” per se, they share the view that the linguistic system is constructed from non-linguistic (i.e. non-grammatical) parts (as per O’Grady 2008a, 2008b), and as such, are in diametric contrast with UG accounts of language acquisition. Emergentist proposals assign language structure to general properties of human cognition, such as working memory and processing and learning mechanisms, as well as communicative functions of language (Bates & MacWhinney 1989; Tomasello 1995, 2003). Lieven (2010a) argues that children build their grammars from phonological-lexical strings in the input; this is the starting point and will affect the course of learning. However, she points out that the children’s analysis of the input is influenced by what the children want to say, which in turn will affect both intake and production. The process of acquisition is then one of complex interactions between the child’s cognitive systems, the nature of the linguistic input in the environment, and the need and desire for communication.

Cross-linguistic FLA research conducted from a functionalist/emergentist perspective (e.g. Bowerman 1982; Hickmann 2003; Slobin 1985a, 1985b) takes a similar approach to that of the Learner Varieties approach in SLA (discussed in Chapter 2), the focus being on the acquisition of semantic and pragmatic elements of language. Bowerman (1982) claims that the domain-general innate forms are of a semantic nature and as such help the child interpret the environment. Only later do abstract grammatical classes (e.g. noun, verb) emerge. Language can push the child to attend to aspects of referents and develop certain cognitive concepts even at a very early age (Bowerman 1996; Gopnik & Choi 1990).

In essence, in all emergentist approaches, aspects of language “emerge”, representations “emerge”, and complex patterns “emerge”. “Emergentists believe that simple learning mechanisms, operating in and across the human systems for perception, motor-action and cognition as they are exposed to language data as part of a communicatively-rich human social environment by an organism eager to exploit the functionality of language, suffice to drive the emergence of complex language representations” (Ellis 1998: 657). Ellis observes that from a UG perspective we can only have a theory about the development of something if we have a theory about what that something is (hence the theory of UG). He then counters this belief from the emergentist perspective by stating that in order to truly understand something, one needs to know how that something came about (hence empirical and heuristic studies of development).

1.1.3 What is the nature of the linguistic input and what role does it play in child language development?

The theoretical approaches described above make drastically different assumptions about the nature of the linguistic input. As in the section above, I will discuss these assumptions in a binary manner, opposing the UG and the emergentist approaches to the question.

1.1.3.1 Universal Grammar: the nature of the input and its role in L1 development

As discussed above, generative grammar attributes an innate language mechanism to the child, giving the child a head start in analyzing the input. This claim is made largely because of “input constraints” (Goodluck 2007: 46), a component of the poverty of the stimulus (POS) argument (Chomsky 1980). In addressing the question of the role of input in language acquisition, Valian (1999) identifies three types of evidence that lie at the heart of these input constraints: positive, direct negative and indirect negative. From a UG perspective, positive evidence is essentially input that confirms the child’s hypothesis. A child’s input consists of strings of words, and to acquire the language, a child will need to attach a structural analysis to these strings. Using an example from a parameter-setting model, we might imagine that the default setting for subject pronouns is the “non-null” setting, the setting that requires an overt subject (e.g. “She sings”). The child (regardless of the ambient language) therefore expects to hear the subject pronoun. If English is the ambient language, the child will hear the pronoun (e.g. “she”), confirming the hypothesis (the non-null setting). This is a case of positive evidence.

Negative evidence, on the other hand, consists of information about ungrammaticality and comes in two basic forms, either direct or indirect. Corrections of ungrammatical forms (regardless of the type of corrective feedback) and grammar instruction (both implicit and explicit – see Chapter 4) are examples of direct negative evidence (White 2003). Sentences are believed to be tagged as grammatical or ungrammatical, so if a child produces an ungrammatical structure, a parent could provide direct negative evidence by overtly correcting the child or by offering an alternative. There is still much debate about how much correcting parents actually do (MacWhinney 2004). Generally, proponents of the POS argument claim that parents do little correcting of their children’s ungrammatical productions (Valian 1999). If children are not corrected, we might expect that they are likely to believe that their structures are grammatical. However, indirect negative evidence is claimed to be able to change this.

A case of indirect negative evidence is when the learner determines that the structure is simply not in the language. For instance, a child exposed to Spanish input has the same default setting as the English speaker (e.g. non-null) but will hear sentences with a null subject in Spanish (e.g. *canta* “sings”). The child may expect to hear the overt subject but instead hears no subject. In other words, the child’s grammar mechanism might search for the cue for a particular setting to a parameter (e.g. non-null) and in the absence of this cue trigger the other setting (e.g. null). This is a case of indirect negative evidence or “absence of stimulus” (Lightfoot 1998: 585); it disconfirms the child’s hypothesis. The POS argument relies on this “evidence” approach to the input in that if we view children as having innate default settings for grammar, then their system will naturally be constrained by indirect negative evidence. In other words, the child’s system will need to respond to the fact that some expected linguistic features do not appear in the ambient language.

The POS argument has greatly influenced the UG-based research program. It is not surprising, given this view, that input is viewed as having a triggering role in FLA and therefore need not be observed and meticulously analyzed. Researchers working in this perspective refer to the “logical problem of language acquisition” (Baker & McCarthy 1981). This problem is the result of the complex knowledge to be acquired, the limitations of the available data due to POS, and the inadequate learning mechanisms. Generativists attribute innate linguistic knowledge of the universal properties of language to the child, which are believed to guide the child in constructing the language-particular instantiation of universals from the input. Hence, the input is viewed as a trigger for this instantiation to happen; children “choose” correct parameters based on a minimal amount of linguistic data (i.e. very little input) (Hyams 1987).

1.1.3.2 Emergentism: the nature of the input and its role in L1 development

In theories under the emergentist umbrella, the properties of human cognition and communicative functions of language are responsible for the development of language (Tomasello 2003). Language is made accessible through the input and in concert with cognitive structures and processes. More specifically, the developing language of children comprises constructions or form-meaning mappings that are available in the linguistic input and for which the child makes associations (Ellis 2008). These mappings include units that relate the defining properties of morphological, lexical, syntactic forms with semantic, pragmatic and discourse functions and can be individual words represented and stored in multiple forms (Bates & MacWhinney 1981; Goldberg 1995, 2006). For example, the form “book”, with the final “-s” morpheme is a construction that designates more than one (this is the “function” or “meaning”). Likewise, the lexeme “book” can be replaced by “chair”, with the “-s” morpheme, also designating more than

one. The construction is N + -s, where N, replaced by any count noun, will continue to signify “more than one”. Grammatical knowledge is said to be instantiated in the learning of these form-function pairings or constructions (Boyd & Goldberg 2009). These constructions are universal cognitive structures (not innate linguistic structures) accessible to the child through language input. The child learns through inferring from the input and making these form-function associations.

Bybee (2006) highlights the fact that the input contains information that a child can *use* to build structures. The child has the capacity to extract this information and is able to use it to infer structural properties of the ambient language. As such, communication and interaction strengthen a child’s knowledge of language over time in that this communication provides opportunities or “experience” for the child to interpret and produce utterances (Bybee 2006: 711). This experience is not negligible. Indeed, language learning through communication is an essential construct in functionalist and usage-based approaches, which hold that we learn linguistic constructions during communication (Bybee 2010). In other words, language arises from engaging in communication, so the nature of the input has a defining role in child language acquisition. Not only do children need to receive input, but they also need to engage in communication by interacting with the input, with caregivers and other children. Language use shapes grammar, and frequent repetition is the mechanism that drives this language-shaping process (Bybee & Thompson 1997; Givón 1979). Detailed studies of frequency are therefore part and parcel of emergentist methodology.

An interesting example of language in use is Ferguson’s early study where he observed the babbling of one child (aged 403 days) on one day (Ferguson & Slobin 1973). Although he acknowledges that he can make no generalizations based on data collected from only one child, the study was unique in that it was the first published study of “distinctive features” in babbling as postulated by Jakobson, Halle & Fant (1952, cited in Ferguson & Slobin, 1973). Ferguson discovers patterns of features in the babbling of the child and writes: “The child may be thought of as playing a game, which consists of adding more commands to the syllable, producing more complex initial segments, for syllables toward the end of the sequence” (9). In the observation of sound perception in infants, von Raffler-Engel (1965, cited in Ferguson & Slobin, 1973) shows that the first, still non-expressive, purely phonetic attempt at language is the bilabial.

Studies of very early FLA reveal some information about how infants analyze the input. In the areas of phonology and perception, research programs have developed phenomenally since the 1970s as outlined by Jusczyk (1997). An example can be found in the work of Nazzi, Jusczyk & Johnson (2000), who show that 5-month-old infants can discriminate dialects of their L1. The authors suggest that the child’s experience with the L1 plays an important role in the development of language-discrimination abilities. Using a head-turn preference

procedure, they found that discrimination of languages from within the native-language rhythmic class did not occur when infants had no prior experience of the two languages presented in the test. The infants (American) were able to distinguish their dialect from British English, suggesting that they had learned about the specific rhythmic and prosodic organization of their ambient dialect.

Saffran, Newport and Aslin (1996) discovered that 8-month-old infants exposed to a stream of nonsense syllables were able to distinguish between pseudowords and nonwords (same syllables as pseudowords but presented in a different order). Results indicate that, at this young age, infants were able to extract statistical regularities from an unfamiliar continuous speech stream.

The competition model (Bates & MacWhinney 1987; Kail 1989, 1990; MacWhinney 2001), a model of sentence processing, takes the important role of the input a step further and considers the cognitive charge involved in processing the input and mapping form and meaning. Variables include cue cost, weight and validity, and the input to the learner is analyzed with respect to these variables. In language processing and acquisition, features are regularly in competition with each other relative to these variables in order for the system to assign meaning to the forms in the input. It is this cognitive activity that drives acquisition.

Dynamic Systems Theory (Bassano & van Geert 2007; van Geert 1991, 1994) is another emergentist approach to language development that attributes an invaluable role to the input. The perception of language development from a DST perspective is one in which the emergence of language abilities is viewed as flexible, transient and dynamic in real time (Evans 2007). Language abilities change on a regular basis, and a unique element to this theory is that it can account for how children's language not only develops towards a more target-like structure, but may also revert back to the level of performance of a relatively younger child. The goal of the approach is "... to identify the mechanisms and states of the child's emerging language abilities that engender developmental change at all levels of real-time continuous processing" (Evans 2007: 128). The change relies on the child's engagement with the environment, be it linguistic, social, emotional, and so forth.

Within a functionalist/interactionist/emergentist approach to FLA research, cross-linguistic studies are prominent. Those conducted in the 1970s and 1980s contributed significantly to our understanding of how children begin to amass a vocabulary and break into the grammatical structures of their language (e.g. Bates et al. 1982; Peters 1983, 1985; Slobin 1973, 1985b). Their work highlighted the importance of patterns in languages, such as prosodic patterns and the location and regularity of morphemes. Lieven (2010b) points out that tone, for example, is used to communicate and interpret syntax in some Bantu languages, lexical items in Chinese and pragmatics in English. These patterns

play an important role in children's processes of identifying words and inflections in the input they hear. Slobin (1985b), for instance, delineates how individuals register frequencies during communication and in interaction with language input and show sensitivity to the input frequencies of patterns.

The linguistic domains of semantics and pragmatics are particularly important objects of investigation in functionalist cross-linguistic research. Questions concern the organization of discourse and the use of discourse cohesive functions, such as learning how one linguistic device might serve different functions. Slobin (1987) proposed the notion "thinking for speaking" to refer to the fact that children's thinking in terms of conceptual development is shaped by their ambient language and that they learn very early on to adopt a particular way of organizing information based on the L1 input. Cross-linguistic studies in various domains of language provide support for this claim. For instance, Hickmann (2005: 233-4) reports research on the acquisition of spatial language:

[...] young children are quite sensitive to the particular ways in which their native language divides the semantic space within a given domain (e.g. ontology, time, space), thereby learning language-specific underlying categories very early. The impact of such language-specific factors can be observed in varied behaviours (production, categorization, comprehension) very early in development, for example, during the emergence of language and even with young infants during the pre-linguistic period.

Studies examining children's expression of motion events at various ages also show important cross-linguistic differences based on the properties of their L1 (Hickmann & Hendriks 2010).

As is evident in this section, the emergentist perspective proposes a language acquisition system that can be summed up in the article entitled "Language is a complex adaptive system: Position paper" (Beckner et al. 2009). The authors, who adhere to a variety of emergentist models, propose numerous shared assumptions about language, the role of the input, and how children analyze this input. Language has a social function, language is shaped by human cognitive abilities, the cognitive organization of language is based directly on experience with language, the process of grammaticalization is the result of repetition across many speech events, constructions are learned through engaging in communication, and form, user and use are inextricably linked in the various aspects of language, inevitably creating change.

1.1.4 What does the input actually look like in empirical studies of FLA?

In the section above, we discussed the theoretical position regarding the nature of the linguistic input from both UG and emergentist perspectives. But how have investigators actually looked at the environmental input and how do they

describe what they see? In what way do these descriptions contribute to the theoretical perspectives?

1.1.4.1 Universal Grammar: the actual input in FLA

For proponents of UG, Valian (2014: 83) offers insightful comments in the following statement about the input being “rich”:

I put ‘rich’ in quotes because ‘richness’ is in the ear of the beholder. For organisms with a grammar, the input is incredibly rich: it contains examples of all syntactic features and categories, it reveals connections between word order and semantic roles; it at least indirectly illustrates various principles of grammar such as those that determine when it is grammatical to use a reflexive pronoun. But for organisms that will never acquire a grammar, like dogs, the input is not rich at all. The presence of rich input would only be relevant if it could compensate for lack of innate content. Infrahuman primates like bonobos can make use of some sound–meaning correspondences for lexical items but they never develop syntax.

But what *is* the input that Valian refers to as being rich or not? Databases have been created for the numerous child language input studies that have generated enormous quantities of rich data (see the CHILDES database, MacWhinney 2000). In the 1970s, many researchers from fairly neutral theoretical standpoints at the time recorded child-parent interactions at various time intervals to investigate how children learn language (e.g. Brown 1973; Clark 2003; Newport 1976; Newport, Gleitman & Gleitman 1977; Snow 1972). As recognized in Valian’s quote above, the actual input addressed to the child can be described, but depending on one’s theoretical perspective, this monumental task is more or less worthwhile. How the investigator analyses the input also depends on the theoretical framework. For instance, from Valian’s (1999) perspective, the objective of input studies is to discover the features of the child’s positive evidence (i.e. features in the input), and how these correlate with the child’s language development. This type of observation does not necessarily require enormous amounts of input data given that the triggering of a parameter can happen quite rapidly. Valian (1999), following Newport, Gleitman and Gleitman (1977), also points to problems with using input as the basis for studying language development. Most importantly, the researcher faces the challenge of comparing child production data based on interactions with caretakers (especially mothers) who differ in their style of responding to the child and in their speech styles.

1.1.4.2 Emergentism: the actual input in FLA

Much research has continued in this vein, however, and has been enhanced with more frequent and thorough recordings that often also include video (e.g. Aguado-Orea & Pine 2015; Lieven, Salomo & Tomasello 2009; Morgenstern 2009). In these studies, the input addressed to the child is analyzed and coded for features such as sentence length and type, structural complexity and frequency. The child's speech is also coded for syntactic complexity, mean length of utterance, NP and VP frequency and length, and so forth. The outcome is a plethora of analyses on child language acquisition that have nourished the debate from questions of innateness to how children filter out less pertinent information while selectively listening to other information.

Original input studies of this kind discovered that "maternal speech" is not simply adult speech. Mothers adjust their speech to their child's stage of language learning. This type of adaptive input, which was found to enable the child to learn from the mother's speech, was coined "Motherese" (Snow 1977). Adults simplify their speech by following the child's attentional focus, adjusting their speech to the child's level of comprehension, speaking more slowly and with highly grammatical structures, higher and broader pitch than with adults (Snow 1977). In fact, the child may be the source of this input adaptation in that the adult responds to the child's ability to process information or not (Newport 1990). The input is therefore modified based on what the child is ready to take in and is considered, at least by some, to be relatively complete and error free (Clark 2009). The term used more recently for this adaptive input in FLA is Child-Directed Speech (CDS),

Usage-based research in FLA makes use of the large parent-child language databases mentioned above (e.g. Lieven 2010a; Lieven, Salomo & Tomasello 2009), which allow for meticulous analysis of the CDS and the child's interaction with this input. Research has revealed that children's language development is strongly influenced by the statistical distribution of surface properties in the language input (e.g. Ellis 2008; Saffran et al. 1997; Tomasello 2003). In this account of acquisition in which frequency is an essential construct, the frequency of elements in the input, such as lexical items and constructions, can and must be measured. Repeated exposures to these elements, combined with other factors such as saliency, reliability and regularity of form-meaning mappings, have been found to affect learning, and as Bybee (2006) points out, the cognitive representation that can be called a "grammar" is strongly tied to the experience a speaker has had with language. As a result, the description of input properties has received much attention by proponents of this line of research. The usage-based approach asks the questions: What does frequency signify? What do we expect frequency effects to mean in terms of linguistic and cognitive capacities? The measures of token and type frequency are particularly important for both

FLA (e.g. Dąbrowska & Szczerbiński 2006; Goldberg 2006) and SLA (e.g. Ellis & Collins 2009) and will be discussed in more detail in the following section on SLA.

1.1.5 Conclusion

This section has only briefly highlighted some of the important questions and issues addressed in FLA research; it by no means does justice to the phenomenal and rich research produced by the various schools of thought. This brief overview, however, was intended to provide the reader with an introduction to the primary theoretical positions in FLA that are relevant to my work in input processing at the early stages of foreign language acquisition. In particular, the distinction between the generative-based and emergentist positions in FLA can be seen in not only the approach to the object of study, input, but also in assumptions about language development.

1.2 Second (and subsequent) Language Acquisition: Theory and models relevant to the early stages

1.2.1 Introduction

Given the relative recentness of second language acquisition (SLA) as a recognized field of research, an impressive number of theories, models and hypotheses have appeared in the literature. Only a select number of these will be treated in this document, those that address, explicitly or tacitly, the issue of the initial state and/or input processing at the early stages of foreign language acquisition.⁸ This section extends the previous discussion of first language acquisition (FLA) theory with brief descriptions of theoretical frameworks in SLA that have inspired and challenged my work, many of which grew out of FLA research or corroborate FLA theories.

The previous section on FLA introduced two principal theories in the study of how children acquire a language: generativist theory and single-process theory (Tomasello and Abbot-Smith 2002). MacWhinney (2010, 2015) extends this observation to the modern study of language, identifying two paradigms: Universal Grammar (UG) and emergentism. Hulstijn (2015) specifies a similar categorization for theories of second language (L2) development, grouping theories into “generative” and “usage-based” schools.⁹

Following Dimroth (2015), I will argue that the Learner Varieties (LV) approach to SLA is somewhat difficult to place into this dichotomy. It aligns with emergentism in that it views acquisition as the gradual emerging of all aspects of a learner variety. It differs, however, from usage-based thinking in that it assumes an important role for linguistic principles that are not dependent on usage or frequency in the target language (TL) input. It also differs from generative-based theories in that it does not posit a UG; however, it does propose a language-making capacity (Slobin 1985b), a language faculty of sorts that can copy and construct language and communicate in language (Klein 2012). This approach was developed following the discovery of the Basic Variety (BV), a

⁸ The terms “foreign language”, “non-native language”, “second language” (L2) and “target language” (TL) are used interchangeably in this document, as are the terms “first language” (L1), “native language” (NL) and “source language”. I address the distinction between these terms only when the theoretical discussion requires it.

⁹ Note also that Matthey and Véronique (2004) distinguish three approaches to theorizing second language acquisition, generative grammar, functionalist and interactionist, the latter two in particular overlapping in interesting ways. In their conclusion, they rightly point out that the generativists seek to explain what language *is*, whereas the functionalists and interactionists seek to explain what language *does*, following Granger (1979).

prototype of a simple but efficient linguistic system observed in the language productions of untutored adults (Dimroth 2013; Klein & Perdue 1992, 1997).

To take this discussion a step further, from the generative perspective in FLA, the child comes to the task of language acquisition with a language faculty that permits the acquisition of linguistic categories and features based on the input of the specific ambient language. In generative-based L2 research, the debate centers not only on refining the understanding of the workings of UG in language acquisition, but also on investigating to what extent L2 acquisition is UG-, L1- and/or input-driven.¹⁰ Rules are not viewed as being “learned” in this framework. As VanPatten (2015) and VanPatten and Rothman (2014) have claimed, there are no rules in the classic sense. In contrast, from an emergentist perspective, the child comes to the task with a cognitive system that allows for all sorts of processing including the processing of language. Complexities of language are “emergent” phenomena (Ellis 2003: 81), and learning rules, or rather “patterns” discovered in the input, is part of this complex process. These two principal approaches to language acquisition therefore posit different accounts of the nature of the linguistic input and the role of this input in the development of child language systems and adult foreign language systems.

As mentioned above, the LV approach falls, to a certain extent, within the scope of emergentist thinking in that it posits “emerging” language phenomena within a functionalist, experienced-based model that requires interaction between language and human cognitive processes, such as attention, perception, memory, categorization, and learning. However, it also posits a language faculty in a way that other emergentist models do not. While the theoretical background of FLA research has provided context for the study of SLA, comparative research is now clearly identifying similarities and differences between the two types of acquisition (e.g. Benazzo 2004; Hendriks & Hickmann 1998; Hendriks & Watorek 2008; Meisel 2011; Watorek 2004a, 2004b; Watorek, Benazzo & Hickmann 2012a). Some differences are quite obvious. For instance, we know that in adult SLA (unlike in FLA), at least one other language has already been acquired and that cognitive abilities are fully developed. A language system already in place assumes sensitivity to semantic and pragmatic elements of language, as well as the basic rules that govern the construction of coherent and cohesive discourse in communication. A major task for adult learners at the early stages of L2 or

¹⁰ This debate was particularly prominent in the 1990s and has evolved since then (see White 2003 for an overview). The prominent positions were as follows:

- 1) Full Transfer/Full Access - all properties of the L1 as instantiated by Universal Grammar (UG) transfer to the L2 initial state (Schwartz & Sprouse 1994, 1996);
- 2) Full transfer – UG disappears; that is, there is no access to UG and the input passes directly into the L1 system (Bley-Vroman 1990; Schachter 1988);
- 3) No transfer – the input passes directly through UG without being filtered by the L1 (Epstein et al. 1998);
- 4) Partial transfer - UG and L1 affect the L2 initial state; that is, certain aspects of the initial state are based on UG, others on L1 (Vainikka & Young-Scholten 1998).

subsequent (third) language acquisition (L3) is to discover how the TL system can be used to express concepts and functions they have already developed in at least one known language (Watorek, Benazzo & Hickmann 2012b), a very different task from that of the child in early L1 acquisition. This observation is central to the LV approach, the focus of which is on learner production, as will be shown below. Other differences are outlined in Slobin (2012). Finally, in terms of the linguistic input, in adult SLA, individuals may be exposed to not only spoken language but also written language.¹¹

This section addresses similar questions to those introduced in the previous section on FLA but from the viewpoint of adult second or subsequent language acquisition.

1. What is the L2/L3 initial state¹² and what is the role of the L1?
2. What is the nature of the linguistic input, and what role does it play in learner language development?
3. What does the input actually look like in empirical studies of L2/L3 acquisition?

In addition to an overview of the literature based on the three questions above, this section introduces the Basic Variety (BV) model (Klein & Perdue 1992, 1997) proposed within the learner varieties (LV) approach to SLA (Perdue 1993), the perspective that has framed my work since my first extensive research project in the 1990s (Rast 1998; Rast 1999). The discussion in this section will serve as a springboard for the description of my past and current research within this framework and my proposals for future research to be continued in the same vein.

1.2.2 What is the L2/L3 initial state and what is the role of the L1?

A primary objective of my research has been to describe the initial state of the adult learner at the moment when the task of learning a novel foreign language first begins. Various theoretical frameworks propose explanations about the initial state. Some ask whether we can consider a learner as still “officially” at the

¹¹ Note that sign language is another type of input to which children and adults may be exposed (e.g. Sallandre & Blondel 2010).

¹² Although I use “L3” to refer to foreign languages learned after the L2, this encompasses all subsequent foreign language acquisition without specifying a chronological order (following Rast 2008 and 2010c, but also see Hammarberg, 2010 for a discussion of terminology). A distinction between L2 and L3 is made when relevant. Generally speaking, however, this document regards SLA as encompassing second, third and additional language acquisition research in the sense that its focus is the acquisition of a novel language by adults, while acknowledging that the processes involved in L2 and L3 acquisition may differ. I maintain the L2/L3 initial state in its singular form here, even though I am aware of potential differences between the L2 initial state and the L3 initial state (e.g. Leung 2005). Justification for shifting to the plural form, L2/L3 initial states, requires further research in L3 acquisition, a fairly recent, yet burgeoning field.

initial state after the first minutes of TL exposure, or after a week or a month (Whong & Wright 2013).¹³

1.2.2.1 Universal Grammar: the L2/L3 initial state and the role of the L1

As with research into child L1 acquisition, a fundamental question about foreign language acquisition concerns the nature of the adult learner's linguistic capacity. For both FLA and SLA researchers working within the UG framework, humans have an innate capacity for language; the assumption is that learners' language acquisition cannot be solely based on the linguistic environment because the learners' input is deficient (the poverty of the stimulus – POS - argument, Chomsky, 1980). Therefore, sources other than the input, such as innate knowledge in the form of UG, or the instantiation of UG in the first language (L1) in the case of L2 learners, must constitute the basis for this process. Schwartz and Sprouse (1996) and Sprouse (2009) take a strong transfer stance to this question, that is, the view that the adult language learner comes to the acquisition process with *full* knowledge of the L1 grammar, and that this knowledge will be *fully* transferred in L2 acquisition (the Full Transfer / Full Access model – FT/FA). “This means that the starting point of L2 acquisition is quite distinct from that of L1 acquisition: in particular, it contends that all the principles and parameter values as instantiated in the L1 grammar immediately carry over as the initial state of a new grammatical system on first exposure to input from the target language” (Schwartz & Sprouse, 1996: 41).¹⁴

As mentioned in the previous section on FLA and in the Schwartz and Sprouse citation above for SLA, the UG stance claims a system of principles and parameters. Lardiere (2009), however, argues that the notion of parameter is no longer useful for SLA research following a shift in generative syntax to the Minimalist framework (Chomsky 1995), in which UG consists of elements referred to as phonological, formal and semantic “features”. These features are the elements used to build lexical items in all languages and it is the differences in these features and how these features are bundled together in functional categories that result in differences between languages. Examples of formal features are [+/- *past*] and [+/- *plural*], such as the past tense *-ed* or plural *-s* markers in English. These features are pre-specified in the lexicon, and they head functional categories, such as D (determiner), T (tense), and C (complementizer). In short, features carry phonological, formal and semantic units that make up words. Lardiere argues that the child is endowed with a universal set of linguistic features (i.e. UG). Given that not all languages attest all possible features in the world's languages (see Section 1.1.2.1 on language universals), the child's task is

¹³ The following chapter on first exposure provides a discussion and proposed definition of “first exposure” research.

¹⁴ Principle and parameter values are “instantiated” in the L1 grammar, meaning that the child's system “sets” the values according to the L1 grammar (as revealed by the child's ambient input).

to select only the subset of features used in the language being acquired while ignoring the others. The child assembles these features into language-specific lexical items. It follows that in SLA, the adult language learner brings a fully assembled set of these L1 features, and the way these features have been assembled in the L1 may be different from the way they would be assembled in the L2. Therefore, assembling words in the L2 requires the learner to reconfigure features from the way they are represented in the L1 into new configurations on different types of words in the L2. As Lardiere points out, this task of reconfiguring is "...a formidable learning task that goes far beyond the simple 'switch-setting' or 'selecting' metaphors that have sometimes been used to characterize the acquisition of a L2 grammar" (175).

Ionin (2013) provides a useful overview of the developing research on features. Two types of features have been proposed with respect to semantic content and acquirability in L2 acquisition: interpretable and uninterpretable (Tsimplici & Dimitrakopoulou 2007). The interpretable features have semantic content (e.g. nouns and verbs), express information that is inherent to a category, such as gender on a noun (e.g. *coche* "car" in Spanish carries +masculine), and are generally specified on open class lexical items (Hawkins & Hattori 2006). There is evidence that interpretable features *can* be acquired (i.e. we can learn the semantics of *coche* and that it is inherently masculine). Uninterpretable features, on the other hand, do not have semantic content, are not usable by the semantic component, and are essentially grammatical (e.g. gender on a determiner, such as *el* - "the" - in Spanish, which, like *coche*, carries +masculine). Uninterpretable features signal a mutual dependency of a dependent element (e.g. gender on a determiner) and a functional category (e.g. D - determiner) and must go through an operation, such as *Agree*, to make the connection between the functional head (e.g. determiner - *el*) and the lexical item (e.g. noun - *coche*). In an oversimplified example, once again taking the category of determiner (D), the gender feature on D is neutral - it could be masculine, feminine, neutral or other depending on the language being learned. In the case of TL Spanish, for instance, we have a noun, *coche*, with interpretable features (*coche* is tagged with +N, +masculine, and the meaning "car"). These features can be acquired. The uninterpretable feature gender-neutral D, however, must go through an operation that connects it to *coche* +masculine, an operation that will either succeed or fail. It is this dependency that distinguishes the uninterpretable from the interpretable feature. There is evidence that uninterpretable features *cannot* be acquired (see the Failed Functional Features Hypothesis - FFFH - Hawkins & Hattori 2006; Tsimplici & Dimitrakopoulou 2007). This explains, for example, why English learners of languages with gender agreement (e.g. Spanish) rarely master the use of L2 gender. It follows that adherents of FFFH argue that the starting point for L2 learners depends on their L1. Interpretable features will not pose a learnability problem regardless of the L1; however, in the case of an L1-L2

combination in which uninterpretable features differ, learnability will be a problem (Hawkins & Liszka 2003).

VanPatten (2015) and VanPatten and Rothman (2014) confirm this shift to features and functional categories when explaining the L2 learning process, suggesting that when learners encounter language, they must tag the surface components (a word or words) with their meaning and function. A word must be assigned a category, which will in turn lead the parser to project a partial sentence structure. For example, “If an NP is encountered, the parser will project its relationship to other sentential phrases” (VanPatten 2015: 92). In other words, if the parser takes the word to be a subject, it will then project the word into subject position. It is features that lead words to behave in certain ways and to provoke operations, such as Move, Merge and Agree. In terms of the initial state, VanPatten and Rothman (2014) claim that, “these aspects of language are ‘owned’ by everyone and need not be learnt. That is, they are not dependent on external stimuli for them to exist in the mental representation” (19). A learner’s L1 may assist with extracting meaning from the input in order to tag words and assign them to a category for parsing (VanPatten 2014); however the influence of the L1 is viewed as selective and variable across individual learners (VanPatten & Williams 2007).

In her Autonomous Induction Theory (AIT) based on Jackendoff’s (1983, 1997) autonomous faculty of mind, Carroll (2001, 2002, 2004) posits processing mechanisms that are innate and operate automatically and unconsciously, while rejecting the claim that parameters function as mechanisms of acquisition. L2 acquisition is viewed as learning linguistic categories (assumed to be universal), configurations of linguistic units, and correspondences of configurations across the autonomous levels. Carroll (2002) underlines that, in acquisition theory, an acquisition mechanism must make it possible to process language (at all levels – listening, speaking, reading and writing). As such, speech-processing mechanisms are related to acquisition mechanisms and are innate and beyond conscious control. Processing procedures, on the other hand, are not innate and reflect L1 structural and frequency properties. It follows that the procedures of speech perception, word recognition and sentence parsing transfer from the L1 when confronted with L2 input. In the early stages of L2 acquisition, these procedures will fail because “...they cannot analyse information at one autonomous level relevant to defining constituents at another level” (Carroll 2002: 227). In other words, the phonological information received from the L2 input can only be properly analyzed if other levels of representation, such as the morpho-syntactic level, are also available. In essence, “input” is not simply the raw language of the environment; it is also the information provided from one internal system to another. Human beings are equipped with autonomous representational systems that enable them to encode speech. This includes the

basic operations of the parsers and the speech production mechanisms, which do not need to be learned. These systems constitute part of what Carroll (2002) refers to as the “basic human language-making capacity” (230). With this in mind, Carroll characterizes UG as follows: “...it consists of the representational primitives of the initial representational capacity for language, plus the encoding operations” (230). The L2 initial state is therefore partially characterized by UG constraints but also by L1 transfer. Citing a plethora of L1 transfer research (e.g. Kellerman 1987; Kilborn & Ito 1989; Odlin 1989), Carroll assumes that the starting point of L2 acquisition will also include the ability to map the content of lexical entries, based on L1 knowledge, onto L2 forms (238).

Also building on Jackendoff’s model, Sharwood Smith and Truscott (2014) support the need for positing theories of SLA beyond linguistic theories and, in doing so, propose a modular model with a processor that can explain development, the Modular On-line Growth and Use of Language (MOGUL) model. The architecture of MOGUL comprises an innate Language Module (the core language system) that itself contains a phonological module and a (morpho)syntactic module that are connected within a domain-specific area (i.e. specific to human language). These modules have connections with systems “outside” the core language system, namely auditory-acoustic, articulatory, visual and conceptual systems, which deal with what is generally referred to as semantics and pragmatics. These external systems, referred to as “language broadly defined” (17) are presumed to be responsible for processes, such as the interpretation and encoding of the meaning of perceived sights, sounds and smells. The interconnectedness of the various systems allows for the model to explain processes having to do with memory, perception, consciousness and affect (emotion).

Likewise, O’Grady (2005) proposes a model for development, one that claims an efficiency driven processor as the principal driver of language learning; however, as mentioned earlier in this chapter, he does not distinguish language processing from other types of cognitive processing as Sharwood Smith (2014), Sharwood Smith and Truscott (2014) and Carroll (2001, 2002) do.

Leung (2005) was one of the first studies to investigate the L3 initial state from a UG perspective. Based on results of her study, Leung proposes that the L3 initial state involves not only transfer from the L1, but also at least partial transfer from the L2. Given the observation that transfer originates not only with the L1, she concludes that L2 and L3 acquisition are not one and the same. Others, such as Flynn, Foley and Vinnitskaya (2004), also investigated L3 within UG, but their focus was not specifically the initial state. Flynn (2009) would later build on the 2004 study to conclude that although her cumulative enhancement model still holds up (i.e. that prior language can be neutral or can enhance subsequent language acquisition), UG remains unchanged during language acquisition, even in L3 acquisition.

Research in the generativist tradition has continued to investigate the L3 initial state, as can be seen in García Mayo and Rothman's (2012) review of recent L3 acquisition research. In particular, García Mayo and Rothman cite the position stated by Cabrelli Amaro, Iverson and Tiffany (2009) and Iverson (2010) that examining transfer at the L3 initial state can provide a unique opportunity to compare adult L2 theories of UG accessibility. If evidence of L2 functional categories and features that are not present in the L1 is found in early L3 grammars, then we can conclude that UG must be accessible in adulthood. If UG were not accessible in L3 acquisition, then we would only see L1 categories and features (not L2) transfer in initial L3 acquisition. Of course, as the authors point out, if no evidence is found, this does not mean that UG is not accessible, only that it has not been observed.

1.2.2.2 Emergentism: the L2/L3 initial state and the role of the L1

According to proponents of emergentist models, the L2 initial state naturally differs from the L1 initial state in that L2 learners have previously invested their resources in the development of another language, their L1, and have gained fluency in that language. The L1 and L2 are inextricably linked in that L2 learners have expectations based on their L1 and their attention to the L2 input is influenced by the L1 (i.e. transfer effects). Ellis (2013) explains that these transfer effects bias learners' estimations of the new language and produce the limited attainment typical of adult L2 acquisition. This new system, like all language systems, is dynamic; changes will continue to occur. Other than the difference of prior language learning experience, emergentists generally view the continuing process of language learning (now an L2) as a similar process to that of the L1. As with FLA, emergentism in SLA holds the belief that L2 learners come to the acquisition process with human systems in place for perceiving, memorizing and learning, a process in which language and other cognitive factors interact. As Ellis (2008) explains, in this dynamic and circular system, usage leads to change, change affects perception, perception affects learning, and learning affects usage.

Models that adhere to this stance are numerous. Given that their focus is how language emerges, develops and interacts with the learner's ambient input, descriptions of a selection of these models appear in Section 1.2.3.2 on emergentism, the nature of the input and its role in L2/L3 development. As mentioned in the first part of this chapter, research paradigms that propose these models include, but are not limited to, connectionism (e.g. Bates & MacWhinney 1987; Ellis 2006b), constructionist (e.g. Ellis 2003, 2006a, 2008; Ellis & Larsen-Freeman 2009; Goldberg 2003, 2006), functionalist-interactionist approaches (e.g. Chenu & Jisa 2009; Dimroth & Starren 2003; Hendriks 2005; Hickmann, Hendriks & Roland 1998; Perdue 1993), dynamic and complex

systems models (e.g. De Bot, Lowie & Verspoor 2007; Larsen-Freeman 1997; Larsen-Freeman & Cameron 2008), and models based on statistical probabilities (e.g. Hudson Kam 2009; Perruchet & Poulin-Charronnat 2012; Saffran et al. 1997; Williams & Rebuschat 2012).

As mentioned above, the LV framework shares aspects of emergentist thinking. Inspired by Corder (1967), it emphasizes the importance of viewing learner varieties as entities to be observed and studied in their own right, not as error-ridden, unsuccessful deviations of the TL. LV research also aligns, to a certain extent, with Selinker's (1972) work on "interlanguage", the go-to term for SLA researchers investigating learner language as dynamic varieties that can be observed throughout the L2 acquisition process (e.g. Han & Tarone 2014).¹⁵ Slobin's (1967, 1973, 1985a, 1985b) cross-linguistic work in FLA also influenced the LV framework in its approach to analyzing learners' productions in real interaction and comparing them with those of native speaker controls and speakers of other languages (see Perdue 1993 and von Stutterheim & Larsen-Freeman, 1989 for original work conducted within the LV framework).

LV also assumes some level of language innateness. To provide context for this viewpoint, Klein (2012: 25) addresses the question of how humans came to use language:

There must have been a time, very long ago, in which the language faculty already existed in the brain of our ancestors, due to some genetic changes in our species, but in which there was no single linguistic system. At that time, no one was exposed to a language: there was no input that our ancestors could learn from. They could not copy an existing system – they had to invent, to create, to construct such systems. And they did.

Following this logic, Klein identifies two quite distinct capacities of "genetically given human language faculty": the faculty to *copy* a linguistic system and the faculty to *construct* a linguistic system (26). Tacitly referring to the volumes of literature on human language, he adds that these faculties are believed to correspond to two types of transitions from a language faculty to a linguistic system: language learning (to copy) and language creation (to construct). The literature suggests that the essential difference between these two systems appears to be that one of them (learning/copy) works on input, and the other (creation/construct) does not. Logically then, the first systems involved no copying because there was no input to copy. Not convinced by this description of

¹⁵ It is worth mentioning here that similarities can be found between the LV approach and the interactionist approach developed in North America. Although their historical roots differ, which explains some of the fundamental differences in their research questions and methodologies, interactionists claim a "robust connection between interaction and learning" (Mackey, Abbuhl & Gass 2012: 9). Given their focus on interaction in the classroom, the North American interactionist research is discussed primarily in Chapter 4.

how language development works, while also acknowledging that we know little about this, Klein speculates that the creation of the first systems also involved copying, and that it was certainly not one particularly talented person among our ancestors who came up with the first linguistic system and taught it to family and friends. “The creation of the first linguistic system was the result of a fundamentally social process, which of necessity involved a massive amount of mutual copying” (26). It follows that language learning and language creation are essentially “social processes”, leading Klein to posit a “communicative faculty” (26). Given that human beings are born with the ability to learn language and that these three faculties are essential in this process, Klein proposes that, “there is not a single uniform and well-defined ‘language faculty’. Instead, there is a genetically given *set of capacities* which may be partly species-specific and partly domain-specific” (26). He notes that other species do not construct or copy *linguistic* systems. There are certainly many reasons for this, but Klein suggests that the human ability to construct language systems is due to the way in which these three faculties, “copying”, “construction” and “communicative”, interact in specific social contexts (i.e. in communication). Hence, the language faculty does not resemble a UG as generative-based researchers describe it, but rather a mental faculty that has the capacity to copy language, to construct language, and to communicate in and with language. In this way the human language faculty dictates principles of L2 acquisition, but the role of this so-called language faculty differs from that described in the generativist research.

The LV approach established itself with an extensive cross-linguistic project on the acquisition of host languages by untutored adult immigrants in Europe funded by the European Science Foundation (ESF) that sought to understand the underlying processes involved in adult language acquisition (Perdue 1993). To do this, the research teams recruited participants at the earliest levels of acquisition possible. As immigrants who had moved to their host countries before the onset of the project, all learners of the study had been exposed to their host languages to some extent before the data collection period began. As a result, some learners were beginners, referred to by Klein & Perdue (1992: 313) as “real” beginners (Paula, Berta and Fatima), although they were not absolute beginners in the sense of no prior exposure. The study, based on six source languages (Punjabi, Italian, Turkish, Arabic, Spanish, and Finnish) and five TLs (English, German, Dutch, French, and Swedish), resulting in a total of ten pairs of source- and target-language combinations, produced some of the first serious reflection about the early stages of adult language acquisition.

One of the principal findings of the ESF research was the discovery of a so-called “Basic Variety” (BV), a “well-structured, efficient and simple form of language” (Klein & Perdue 1997: 301). ESF data reveal the interaction of a small number of organizational principles and constraints that determine the utterance structure of the BV and are, for the most part, independent of the specifics of source and

target language discourse organization, with the exception of lexical items. It is then the discourse organization that constrains the way speakers arrange items in an utterance (Dimroth & Starren 2003; Klein & Perdue 1997; Master, Schumann & Sokolik 1989; Starren 2006; Watorek 1998;). Two examples of such constraints are “Controller First” (the NP-referent with highest control comes first) and “Focus Last” (new information comes at the end of the utterance) (Perdue 1993, Vol. II), both observed in the ESF data in various source and target language combinations.

LV research at the advanced levels of L2 acquisition has already provided some interesting insights into the nature of the L2 initial state. For example, studies have revealed time and time again that when constructing a coherent text (in particular a narrative or a description), advanced language learners organize information across utterances differently than native speakers (e.g. Carroll & Becker 1993; Carroll & von Stutterheim 1997; Lambert 1997; Watorek 2003; Watorek & Perdue 1999) and do not necessarily follow the structure of the L1 or that of the TL input. Watorek and Perdue (2005) provide a revealing example of the latter in their analyses of productions of advanced L1 Italian and L1 Polish learners of French, which resemble each other more than either group resembles the productions of the French native speaker control group.

The research delineated above led to further reflection about whether or not such constraints are universal. Klein (1998: 545) posited that the BV reflects principles that are “dictated by the human language faculty” following Klein and Perdue (1997: 339): “There is no reason why these constraints, whatever their precise form may be, cannot belong to the genetic endowment of our species”. Klein (2001: 90) pursues this line of thought: “To the extent that learner varieties also exhibit properties which are independent of source and target language, we must assume they immediately reflect creative processes of the underlying human language faculty. Where else should these properties come from?”

Viewing the BV as impermeable to source and target language influences (with the exception of word choice), Klein and Perdue (1992, 1997) sought to identify the universal principles that must be at work. Klein (1998: 545) writes:

In the present context, two facts about the Basic Variety are particularly remarkable. First, all speakers in our sample used it at some time; in fact, many stopped at this level. If this is correct in principle, then the properties of the Basic Variety cannot be derived from the particular languages involved, except for the choice of lexical items: The Basic Variety must somehow reflect principles dictated by the human language faculty.

Thus, according to Klein (1998), the BV is not simply transfer of the L1 nor is it simply imitation of the L2. The BV is something else, and it is this something else

that the LV approach seeks to identify. In terms of research at the initial state, we are interested in understanding the processes involved in acquisition even before learners arrive at the level of the BV. If properties such as frequency in the input appear to have little to do with the development of the BV, is this true as well for earlier stages? Note that Klein and Perdue (1992) also identified a “pre-basic variety”, described as possibly the first early systematic oral production stage in adult language acquisition (see also Bernini 1995). The pre-BV, also a simple variety, differs from the BV in its lack of verbal utterance organization.

As per emergentist approaches, the LV approach also assumes a special status for the adult learning a new language (relative to children) in that the adult comes to the task with language experience, that of the L1. The LV approach takes the initial state to be the state of the learner at the time of first exposure to the TL.¹⁶ In Perdue’s (1996a: 138) analysis of the early stages of SLA, he replies to the question, “What does the adult absolute beginner bring to the learning task?” He assumes encyclopaedic knowledge and a properly functioning articulatory and perceptual system that are accompanied by the ability to segment the speech stream and assign meaning to its segments. He also suggests that, “this useful knowledge consists of an at least partial understanding of the cognitive categories that universally receive grammatical expression in languages, and also a knowledge of how information is organised in different types of discourse” (138). What differs from most emergentist proposals is the emphasis on the latter assumption, that adults have knowledge of how information (“linguistic” in this case) is organized. Adult language users have experience with communication and make use of organizational principles (semantic and pragmatic) that have been found to be independent of SL and TL (Klein & Perdue 1992, 1997).

Research investigating the L3 initial state and the role of the L1 and L2 from a generative-based perspective was discussed above. Those conducting research on L3 acquisition from other perspectives have posited several hypotheses that are not necessarily in conflict with those proposed by UG-driven research. Bardel and Falk (2007), Bono (2010), Hammarberg and Hammarberg (2005), Hammarberg (2006), for example, claim a privileged role for the L2 in the acquisition of a new morpho-syntactic system, known as the “L2 factor”. Bono (2006) explores the existence of a “multilingual asset”, that is, the strategic advantage of a multilingual in language learning. For Bono, an accumulation of

¹⁶ From a LV perspective, we view the “L2/L3 initial state” as the state of the mind of the learner at first exposure to the novel TL, that is, before or at the moment of first contact with the new language in question, the starting point of L2/L3 acquisition. What the learner does with language at first exposure gives us insights into the learner’s initial state. However, once the learner has been exposed to the new language, the learner has moved beyond the initial state and into the realm of development, learning and/or acquisition. This will be addressed further in Chapter 2.

language knowledge can be beneficial; however, in order for learners to perceive this potential advantage and take advantage of it, certain conditions must be met. In particular learners need to view their language accumulation not as simply “additional” languages learned, but rather as a “combination” of language knowledge. This knowledge base differentiates the L3 initial state from the L2 initial state in that additional experience and knowledge has been gained and is available for use (see also Cenoz 1997). Many studies have also found transfer effects from both L1 and L2 in L3 acquisition (e.g. Hammarberg 2009; Trévisiol 2006) and psychotypology effects, or “perceived cross-linguistic similarity” (Hammarberg 2009), suggesting an important role for all known languages in subsequent language acquisition.

1.2.3 What is the nature of the linguistic input and what role does it play in learner language development?

Views on the role of the input in SLA differ radically depending on the theoretical framework and perspective on the L2/L3 initial state.

1.2.3.1 Universal Grammar: the nature of the input and its role in L2/L3 development

Schwartz and Sprouse (1996) explain the role of the input from a strong transfer stance. If the linguistic system (i.e. the UG values instantiated in the L1 grammar), cannot assign a representation to the L2 input data, then some sort of restructuring will need to occur; it is the L2 input that triggers this change to the initial state of the L2 system. As such, each stage of restructuring results in a unique interlanguage grammar. This restructuring may vary in its rapidity and in some cases the restructuring may not occur because of deficient or highly obscure input. In essence the input to which learners are exposed plays the important role of *triggering* some sort of change to the system. It is important to point out here that a consistent occurrence of a structure may be enough to trigger this change quite rapidly. Sprouse (2009) argues, for example, that English learners of Japanese should be able to reset their word order parameters to SOV almost immediately because every Japanese clause they hear that contains these constituents will show this word order.

Based on Jackendoff’s model of the autonomous faculty of mind, the Autonomous Induction Theory (AIT) proposed by Carroll (2002: 226) raises the question of “how information encoded in one type of representation (conceptual structures) could come to be encoded in completely different autonomous representational formats (the phonetic, phonological or morphosyntactic) needed to perceive, comprehend and produce speech”. The assumption is that once the “input” from the outside world is mentally represented and “in the system” (Carroll 2001: 10), it can then be converted to “intake”. Intake (following Corder 1967) is input to

speech parsers, the mechanisms that encode the speech signal in mental representations. In this functional architecture, this mentally represented information is the input and output of different processors. As such, “each level of represented information serves as input to the next processor and is the output of the processor which created the relevant representations” (Carroll 2001: 12). From this perspective, the object of investigation is the input (or inputs) “within the system”.

As mentioned earlier, Sharwood Smith and Truscott (2014) propose a model (MOGUL) that posits not only multiple inputs, as does Carroll, but also provides an elaborate account of various processes that lead to language development. As Sharwood Smith (2014: 45) describes, “From a strictly processing point of view, all input processing begins as perceptual processing”. All sensory signal systems must collaborate in order for decoding of the input to occur. These are inputs to other systems within “I-language” (the “internal” as opposed to “external” language – “E-language” as per Chomsky, 1986 - of the speaker/hearer). “After that first perceptual processing step comes an internal, complex set of steps, none of which are a foregone conclusion” (45). The external input provided by an interlocutor or language teacher can only influence the first step of input processing, that is, the perceptual input to the learner. The remaining steps involve influencing the deeper internal processes. Sharwood Smith points out that we know little about these internal processes because they are particularly difficult to observe.¹⁷ In terms of development of language, MOGUL also includes Acquisition by Processing Theory (APT) expressed through the principle “acquisition is the lingering effect of processing” (Sharwood Smith 2010: 175). Through this principle, the model reformulates the problem of development by maintaining the distinction between knowledge and processing, in opposition to emergentist models, which tend to eliminate this distinction.

VanPatten’s (1996, 2012) model of input processing, which also assumes internal processing steps, is based on the premise that learners have limited processing resources and therefore cannot attend to and process all the information in the TL input to which they are exposed. He therefore proposes input processing principles that explain how learners allocate resources when faced with input. His model explains how learners manage to create a new grammar, that is, how they go from having no TL system (in the first stages of acquisition) to “getting” (read as “acquiring”) the new TL grammar. Using his Processing Instruction (PI) model, VanPatten investigates how learners initially connect formal features of the language with their meanings and functions, why

¹⁷ It is worth noting here that these “deeper internal processes” resemble what Klein and Perdue (1997) refer to as the workings of the language faculty. To understand these workings, a logical source of information is the observed processing and utterances of learners as they work on the input to which they are exposed.

they make (or don't make) these connections, and what strategies they use to do this.¹⁸

One of the principles in VanPatten's model of input processing has received a fair amount of attention by SLA scholars, his Principle 1. The Primacy of Meaning Principle: Learners process input for meaning before they process it for form. A number of sub-principles delineate the details of P1, including 1a. "The Primacy of Content Words Principle: Learners process content words in the input before anything else" and 1b. "The Lexical Preference Principle: Learners will tend to rely on lexical items as opposed to grammatical form to get meaning when both encode the same semantic information", a principle tested in several first exposure studies (e.g. Han & Peverly 2007; Han & Sun 2014; Park 2011). Principle 1f. "The Sentence Location Principle: Learners tend to process items in sentence initial position before those in final position and those in medial position" has also attracted interest from first exposure researchers (e.g. Carroll 2012a; Rast 2011). Building on his Input Processing model, VanPatten developed his PI instructional technique, the goal of which is to enable learners to restructure the input in such a way that features are acquired.

As discussed in depth in the first part of this chapter, the nature of the input and its role in language acquisition is not the focus of generativist-based thinking, and, as such, the approach to the question of input is similar in L1, L2 and L3 acquisition.

1.2.3.2 Emergentism: the nature of the input and its role in L2/L3 development

The SLA emergentist frameworks that have most closely examined the input to the learner are usage-based research and statistical probabilities research conducted primarily on the learning of artificial languages (e.g. Reber 1967), inspired by research in FLA. Usage-based SLA also assigns an important role to the frequency of items and constructions in the input. The models maintain that language learners, who acquire the constructions of their language by using them, are sensitive to input frequencies at all levels of representation: phonology and phonotactics, reading, spelling, lexis, morphosyntax, formulaic language, language comprehension, grammaticality, sentence production, and syntax (Ellis 2002). These processes involve the tallying of probabilistic statistical information in the input. Given that language stimuli are ambiguous without the mapping of form and meaning, this information is an essential part of the

¹⁸ Moreno (2014) provides an analysis of several input processing studies, including some that have replicated VanPatten's original studies. She makes recommendations to which VanPatten (2014) replies, expressing his agreement that methodology and assessments should be revisited.

representation of every construction and must be tallied. “Before learners can use constructions productively, they have to encounter useful exemplars and analyze them to identify their linguistic form, their meaning, and the mapping between these” (Ellis 2011: 202).

The two categories generally used to analyze frequency in the input are “token” and “type”. Token frequency measures how often a particular form appears in the input; it counts the real number of occurrences of the form in the external input to which the learner is exposed. Type frequency is the number of distinct lexical items in the input that are substituted in a given slot in a construction (at the word level for inflections or at the syntactic level for two words or more). In English input, for example, the present progressive marker “-ing” is likely to have a high type frequency because it is attached to many frequently used verbs (e.g. doing, working, sleeping, partying), whereas the vowel shift from a present verb form (e.g. “eat” [i]) to a past tense verb form (e.g. “ate” [eɪ]) will likely show low type frequency as English attests few verbs with this characteristic. Although most categories of frequencies are believed to influence acquisition to some extent, it is the productivity of phonological, morphological, and syntactic patterns that is of particular interest, and the assumption is that type rather than token frequency drives this productivity (Bybee & Hopper 2001; Goldberg 2006; O’Grady 2005). Type frequency is believed to be particularly important for productivity because type frequency implies that the construction in question is used frequently, which in turn strengthens representations and makes the construction more accessible for further use. Another argument for the importance of type frequency is that learners will more likely be able to associate a new item to a construction in which they have already heard many exemplars of alternative items within the same structure. Of particular importance is that these associations are contingent upon mapping, that is, the frequency is not worth much if no form-meaning mapping has occurred.¹⁹

Another frequency-based account of language development is the Dynamic Systems Theory (DST) mentioned in the previous section on FLA and its close relation, Chaos/Complexity Theory (C/CT) (Larsen-Freeman 1997, 2013; Larsen-Freeman & Cameron 2008). The central tenet of C/CT is that systems are dynamic because they change, whether gradually or abruptly. According to this research paradigm, language acquisition research needs to account for the nonlinearity of change (i.e. language learners regularly make progress, regress, and move forward again) and explain how change occurs and how elements interact to produce this change. Following on research in the physical sciences and mathematics, proponents of C/CT point out that systems are sensitive to

¹⁹ It is worth noting that this point is reminiscent of VanPatten’s claim that input processing only occurs when a connection is made between form and meaning during real-time comprehension. See in particular VanPatten (2014) in response to frequency effects found in the early stages of TL acquisition.

initial conditions, and that these initial conditions can instigate change. Larsen-Freeman (2013, 2015) gives the example of how the flapping of a butterfly wing in one part of the world can affect weather conditions in another part of the world (known as the “butterfly effect”). The chaos refers to unpredictable change, such as how individual birds interact to form flocks of birds that suddenly all take off and fly away together. Essential to this theory is accounting for learner variability, such as levels of motivation, which often wax and wane. Each system grows in complexity through its own mechanisms of self-organization (internal) and its adaptation to its context (external). In other words, the assumption is that the learner comes to the task of language acquisition with cognitive mechanisms in place, and it is these mechanisms that interact with the linguistic environment. Language development is thus viewed as stemming from the emergence of new forms in the complex system, assigned the imagery of a web rather than a ladder. According to this view, which aligns with usage-based views, “language has the shape that it does because of the way it is used, not because of an innate bio-program or internal mental organ. As for acquisition, it is the frequency of patterns in language use that promotes learning” (Larsen-Freeman 2013: 593).

Dynamic systems (DST) and complex systems (C/CT) accounts of language development also emphasize the importance of characteristics of the input and the learner’s interaction with the input. Given individual differences (Dörnyei 2005) and the variability of the input to which learners are exposed, C/CT predicts that the stages individuals go through in language development are quite different (de Bot, Lowie & Verspoor 2007). Theories of SLA need to be able to explain not only similarities across learners, but also differences.

The LV approach, as mentioned above, assigns an essential role to communication in the process of language acquisition. The organizational principles of a learner’s variety at any given time interact during the process of negotiating language with an interlocutor. Language development is explained as follows: As a learner analyses input over time, the interaction with interlocutors adapts and changes, at which time the learner transitions to another learner variety (Hendriks 2005; Klein & Perdue 1997). As Dimroth (2015) points out, many learner varieties are implicated in language acquisition. Learner varieties are not imperfect imitations of a “real” language, but rather, systems in their own right. Fully-developed languages are merely stable forms of learner varieties. They represent a point at which structural learning ceases because the learner’s variety resembles that of the TL input, the variety of his/her social environment (Hendriks 2005).

The LV stance holds that in language acquisition crucial information is present in the input, and learners use their knowledge and cognitive capacities to analyze this input. It follows that learners need regular exposure to the input, which contains the information needed for organizational principles to inform language

acquisition. Learners use their knowledge and cognitive capacities to analyze this input, and it is this on-going analysis that leads to language acquisition.

In terms of development, as mentioned earlier, from the LV perspective, the learner goes through a series of learner varieties during the process of language acquisition.²⁰ Each variety is considered to be systematic in nature as is the transition from one variety to the next, and all learner varieties comprise a limited set of organizational properties. The structure of any given learner utterance is dependent on the interaction of these properties (Dimroth 2015; Hendriks 2005; Klein & Perdue 1997). Learner varieties are thus viewed as manifestations of the human language capacity and can be observed and studied as such. Hendriks (2005: 2) points out that given this assumption,

[...] the study of this capacity should not start with the most complex of these manifestations, and go from there to the simpler ones. Rather, it is advisable first to study the various organizational principles of human language and their interplay in relatively simple cases, those where the various form-function relations are more elementary and transparent.

Results of the ESF project revealed that the initial steps in acquisition were primarily guided by universal principles (phrasal, semantic and pragmatic), while influences of source and target language features appear more prominently on later varieties (Hendriks 2005). The assumption is that a learner's construction of coherent discourse, whether a beginner or advanced learner variety, depends heavily on the learner's linguistic repertoire at any given time. It is suggested that the need to express more complex information structures "pushes" the acquisition process, hence putting motivation at the forefront of further acquisition (Klein & Perdue 1997; Watorek & Perdue 2005). Subsequent research conducted within the context of the Structure of Learner Varieties (SLV) project continues to investigate these universal principles, putting the ESF hypotheses to the test.²¹

Also of essence to the LV perspective is the belief that the input is not only the language of the environment, but also the language constituted by the interlocutors with whom learners negotiate (Giacobbe 1992). This reasoning led the ESF teams to focus primarily on learners' oral productions during interaction. Language is used to communicate, and as such, it is logical that language learning is affected by situations of communication, especially in the case of learners such as those in the ESF project, immigrants trying to survive in their new environment. For this reason, researchers took the perspective of how

²⁰ Dimroth (2013: 3258) highlights this notion of a series of learner varieties: "During the acquisition process learners develop a series of increasingly complex linguistic systems. Such systems, commonly referred to as 'stages of development' (e.g., Clahsen, Meisel, & Pienemann, 1983), are simply called different LVs here".

²¹ The Structure of Learner Varieties project grew out of the ESF project and received support from the Max-Planck Institute of Psycholinguistics.

the learner works on, analyzes and negotiates the TL input so as to gradually appropriate it for communicative means (Klein & Perdue 1992, 1997). Thus, data analyses of the ESF data tend to focus on oral productions in order to understand the interaction between principles of information structure and linguistic structure on the functioning and development of a learner's system (Dimroth & Starren 2003). As Pekarek Doehler (2000) points out, interaction should be understood as *the* essential factor that structures the developmental process.

The LV model has been viewed by some as more focused on the language system than on language development (e.g. Myles 2013). While there is some truth to this claim, the vast longitudinal nature of the ESF project argues for a different interpretation. As mentioned above, the ESF project set out to observe how adults learn language from the beginning of the process and over a three-year period through exposure to natural spontaneous language input. The identification of different learner varieties is part of this investigation and the researchers working from this perspective are interested not only in how learners make use of their linguistic and cognitive resources to accomplish a given task at a specific time in their language development, but also in how their varieties change over time.

The results of the ESF project suggest that the initial steps of language acquisition can be explained in terms of a developmental sequence. When confronted with a new speech stream, adult learners use phonological and semantic information to assign meaning to sound patterns. Grammatical information is treated relative to the typological relations between the source language and the target language, while principles of discourse organization constrain how speakers arrange these lexical items in an utterance (see also Watorek, Benazzo & Hickmann 2012a).

The discovery that learners' discourse structure appears to be independent of the specifics of not only source language, but also TL organization, combined with the debate about the L2 initial state, led to a focus on the linguistic environment of learners in order to observe more closely how learners analyze and use the TL input in the development of their interlanguage (Gass 1997; Piske & Young-Sholten 2009). As Perdue writes, "This debate can be characterized in a single sentence by the relative importance accorded by language acquisition researchers to the linguistic environment (called "input") to which the learner is exposed" (Perdue 1996b: 1).²² Perdue and Klein saw this as the next step in that the way a learner processes and uses input is therefore decisive evidence in moving forward in this debate. "The functional approach thus attaches great relevance to the fact that the L2 learner is required to use the language in order

²² Original French text: "Ce débat peut être caractérisé en une phrase par des différences d'appréciation par les chercheurs en acquisition des langues sur l'importance à accorder à l'environnement linguistique (appelé "input") auquel l'apprenant est exposé" (Perdue 1996b: 1).

to acquire it, and this poses the problem of what initially is useful knowledge” (Perdue 2002: 127).

Finally, with respect to the nature of the input and its role in subsequent foreign language development, we might imagine that just as L2 acquisition differs from L1 acquisition in that a language is already in place in L2 acquisition, so it is with L3 acquisition. Some knowledge of two languages has become part of the linguistic system and this will have an effect on the acquisition of the new TL (De Angelis 2007).

1.2.4 What does the input actually look like in empirical studies of L2/L3 acquisition?

For decades, regardless of theoretical framework, we have had little precise information about what overall input to L2/L3 learners looks like. This situation is gradually changing.

1.2.4.1 Universal Grammar: the actual input in L2/L3 acquisition

From a generative-based perspective, the external input to the learner is the equivalent of the language of the native speaker-hearer. The two strongholds of this approach, the assumption that the input triggers a change in the complex mental system of representations and the poverty of the stimulus argument, place limited weight on the role of input in L2 acquisition. The language faculty is the object of investigation, and for this reason, the dominant assumption is that the input to the learner need not be thoroughly documented or examined.²³

1.2.4.2 Emergentism: the actual input in L2/L3 acquisition

Statistical learning studies are perhaps the most thorough in their description of the input on one hand because they investigate the learning of artificial languages, which are simple to control, and on the other hand because the object of their experiments is often statistical probabilities, which requires a meticulous calculation of frequencies in the input. While most of these studies are conducted in the realm of FLA, some have appeared recently in SLA (Ellis & Cadierno 2009; Ellis & Collins 2009).

Ellis and Collins (2009) describe in detail how input can (or in fact should) be analyzed and compared to learner data with a view to better understanding the effects of distribution, frequency and saliency of forms in the input on the acquisition of constructions of form-meaning mappings. As they rightly point out:

²³ Exceptions are Carroll (2001) and more recently Rastelli (2014) and Parodi (2014).

Extensive corpus linguistic investigations of the frequencies, frequency distributions, and salience of forms in language input and longitudinal corpora relating the properties of learner interlanguage to the available input have the potential to provide crucial insights into the input-acquisition relationship. (329)

The challenge of course is collecting the input data to be able to run these analyses.

With regard to spontaneous non-instructed input, the largest studies of SLA that have investigated aspects of the input are the ESF and the ZISA projects.²⁴ With respect to L2 input, these projects collected production data and focused on how learners made use of their input to negotiate communication in the TL. Taking into consideration the input addressed to the learner resulted in a breakthrough for investigation into the role of the input in acquisition. After all, it is in the interaction with the interlocutor, and hence the input, where principles of organizational structure will constrain discourse and where these principles and constraints can be observed. Watorek and Perdue (1999), for instance, examined the use of *aussi/anche, encore/ancora* in a corpus consisting of the productions of native speakers and learners of French and Italian. They found that the way learners interact with these particles is dependent on a close interaction between the position of the particle in the utterance and the informational status of the other constituents with respect to whether the reference is maintained, developed or changed.

The actual input to the learner in an LV account is generally viewed as the input of the ambient environment. As such, Perdue (1996b) points out that our understanding of the input and how it is used is speculative. When asking the question “What is initially useful knowledge?”, Perdue (2002: 127) inspired a new research methodology, that of first exposure. Perdue acknowledged the lack of empirical research devoted to observing the TL input to which learners are exposed and to observing how they process this input: “The way a learner works on the input is therefore critical for distinguishing between these extreme positions, or rather, for advancing the debate. This debate, we must admit, has been swimming in empirical impressionism for one major reason: but for one exception (Zwitserlood), there has been no systematic attempt to control the input or its processing by the learner” (Perdue 1996b: 2).²⁵

²⁴ For additional information, see the ESF project (European Science Foundation, *Second Language Acquisition by Adult Immigrants*) in Perdue (1993) and the ZISA project (*Zweitspracherwerb italienischer und spanischer Arbeiter*) in Meisel, Clahsen and Pienemann (1981).

²⁵ Original French text: “La façon dont l’apprenant traite l’input est donc décisive pour trancher entre ces positions extrêmes, ou plutôt, pour avancer dans le débat. Ce débat pêche, il faut le dire, par impressionnisme empirique pour une raison majeure : à une exception près (Zwitserlood), il n’y a eu aucune tentative systématique pour contrôler l’input, ni son traitement par l’apprenant” (Perdue 1996b: 2).

Bernini (2005: 317) provides a good example of one way that input has been measured in LV research. Learners of Italian provided self-reports of their interactions in Italian, with indications such as “[relatively] frequent, varied” and “[relatively] infrequent, reduced” input. The input, for the most part, is related to the learners’ opportunities to interact with native speakers of Italian. For instance, one learner, Markos, preferred using TL Italian not only with friends but also at work, suggesting some degree of frequent and varied input. Another learner, Frieda, had access to a regional variety of Italian at home, but at work, a reduced range of functions and topics limited interactions, and her colleagues often used a local dialect when conversing with each other. This was a case of “restricted” and “infrequent, reduced” input. Instructional input is also considered in Bernini’s study in terms of time (e.g. two hours/week for Markos) and type (e.g. no formal instruction for Frieda) but not in terms of content. Tentative statements are made about the nature of this instruction: “Only in the case of Antje does formal instruction seem to have affected the acquisition process, as evidenced by the type of normative language mirrored in her output” (318).

Although limited in scope, research in Instructed SLA (ISLA) has provided some insights into the input (see Housen & Pierrard 2005 and Loewen 2015 for overviews of ISLA; see also Chapter 4 of this document). Many of these studies examine input in an institutional setting because a delimited setting like the classroom lends itself more easily to control than a natural setting. In ISLA, however, the input is generally in the form of “input treatments”. The performance on TL tasks of one or two experimental groups that receive a meticulously prepared input treatment are compared to each other and/or to a control group that receives no treatment. The “treatment” represents only a small amount of the input to which participants are exposed. One such treatment is the enhancement of a particular form in the input. The enhancement can be controlled, described and measured as can the work conducted in class on the enhanced target form. Many focus-on-form studies have used this type of methodology for examining the role of input in L2 acquisition (e.g. Doughty & Williams 1998; VanPatten’s 1996, 2015 PI studies, and semi-artificial language studies, such as Williams & Kuribara, 2008 and Rogers, Revesz & Rebuschat, 2016).

Recently, however, with the burgeoning of first exposure studies, the input to learners is fully documented, audio and video-taped, and transcribed for comparison with learner productions and performance on tasks in the TL (e.g. Dimroth et al. 2013; Gullberg, Roberts & Dimroth 2012; Rast 2008; Rast & Dommergues 2003; Zwitserlood et al. 1994/2000). These studies will be described in more detail in the following chapter.

1.2.5 Conclusion

Given my interest in understanding the state of the learner at first exposure to a novel TL, the role of the input, and the process of language development, I sought an approach that would allow me to investigate all areas. My research seeks to identify the specific set of linguistic elements to which any one learner is exposed to understand the processes involved when learners analyze their input for the purposes of communication in the TL both at the level of comprehension and production. This understanding of the role of the input is the foundation of the LV approach, following Corder's (1967) proposal to examine learner's errors from an "intake" perspective in an attempt to understand what aspects of the input the learner actually takes in ("intake"). The methodology used in the LV approach to examine the learner's analysis of the input draws heavily on methodology used in the FLA cross-linguistic research conducted by Slobin and colleagues (1985). As mentioned in the previous section, the functionalist school of FLA assigns a significant role to the input in child language acquisition. A major reason for examining the input to which learners are exposed is to observe not only how they work on the input, but also how their varieties develop over time. The generative-based proposals view acquisition from the perspective of parameters that are set or not or features that can or cannot be acquired. The question of how this happens is not a priority because the answer lies in the innate language faculty, which is designed to set parameters or acquire features. The LV approach assumes gradual emergence of linguistic forms and form-meaning mappings through the interaction between the input and cognitive and linguistic foundations. These assumptions encourage research to observe this emergence from the very beginning.

Investigating the properties of foreign language input and their influence on the process of second language learning requires an understanding of not only how learners process and use these properties, but also how various factors constrain and drive these processes. The best way to investigate these properties is to start from the very beginning and observe language learning within a true linguistic environment. This is the approach that first exposure studies have taken, as described in the following chapter.

Chapter 2

First Exposure Studies

2.1 Introduction

What do we know about the very beginning of foreign language learning? Although there is much we do not yet know, we certainly do know that trying to understand, speak and learn an unknown language is a daunting experience. Depending on the language and its relationship to a learner's known languages (referred to as "background languages", Hammarberg 2010, 2014), one might understand bits of the speech stream, or one might understand nothing at all. Through exposure to the language, learners gradually begin to pick up aspects of the novel sound system. Their ears adapt to the new sounds and they begin to discriminate sounds unfamiliar to them before this exposure (Best 1995; Flege 1995; Shoemaker & Rast 2014; Shoemaker 2015). Learners also begin to extract units or words from the speech signal, a first step in segmenting this new stream of sound into something that, for the hearer, resembles language. These units may take on some sort of meaning, either a meaning that coincides with the TL equivalent or one that has a different meaning, a false friend or an invention created by the hearer when assembling phonemes into units in search of meaning. At some point in the process, learners also analyze larger units (e.g. syllables, morphemes, phrases and sentences) extracted from the speech stream (Rast 2008, Chapter 9). Although we know quite a bit about these processes, the previous chapter identified many of the unanswered questions. First exposure studies seek to understand these crucial processes that allow learners to "enter" or "break into" a new language system, processes that theories of SLA need to explain.

The different views on the L2/L3 initial state, the role of the L1 and the role of the linguistic input in the development of a new language system have inspired research on the early stages of foreign language acquisition. Studies focused on first exposure and the early stages of L2/L3 acquisition acknowledge the need for a proper control and documentation of the input, a methodology that allows researchers to disentangle variables and to better understand the processes involved in breaking into a novel language system, including how learners go about processing the input. Studying the role of exposure in this way requires a close examination of the input to which learners are exposed. Artificial languages have often been used for this (e.g. Hulstijn & DeKeyser 1997) because of the difficulty involved in controlling, measuring, coding and documenting the natural language environment of the learner. An instructed setting has also proved to be a practical one for conducting this type of study, allowing researchers to control aspects of the input (e.g. the frequency of words and morphosyntactic structures, Rast 2008), as well as the way in which the input is presented to the learners

(e.g. with or without metalinguistic explanations, more or less focus on formal structures of the input, Watorek, Rast & Hilton 2011).

Essentially first exposure studies assume that the input at first exposure is, at its most basic level, that of the phoneme/sound/form – function/meaning connection. How these connections are made, however, remains controversial. Learners must interpret these smallest units of sound (i.e. combinations of phonetic and graphic units in the input) in order to get meaning from “words” (Saffran, Newport & Aslin 1996; Saffran et al. 1997; Ellis & Collins 2009; Han & Liu 2013). Interactive approaches assume that sounds are analyzed via the search for meaning (Shoemaker & Rast 2013; Carroll 2012b; VanPatten 1996).

Researchers have recognized the interest in studying input processing at the initial state for quite some time. Vainikka and Young-Scholten (1998: 31), for instance, suggested that, “in order to make any claims about the learner’s initial state, data need to be collected from learners at the earliest stages of acquisition.” Some have believed the task to be an impossible one. Grüter, Lieberman & Gualmini (2008: 54) claim that, “testing learners at the very outset of L2 acquisition is generally not feasible, as they would be unable to fulfill even basic task demands in the L2.” Within generative-based studies of the L2 initial state, investigation becomes interesting once learners have a morpho-syntactic system in place. Some studies claim to investigate the initial state, but only begin collecting data well after first exposure. Rothman & Cabrelli Amaro (2010: 199), for instance, tested L2 and L3 learners “at the initial state of acquisition, that is, during the onset of language learning after a minimum of 20 hours and a maximum of 30 hours of formal instruction/exposure in a university setting”. Although Rothman and Cabrelli Amaro’s study does not claim to be first exposure, their research questions address the initial state. According to their methodology and theoretical framework, 20 hours provided enough initial instruction to collect relevant analyzable data. It is worth noting, however, that having a full documentation of the input (i.e. from the beginning of TL exposure) could only enhance this type of study in that input effects could be disentangled from L1 transfer and UG. As Ionin, Zubizarreta & Maldonado (2008) point out, it is still unclear what the relation is between input, L1 transfer and UG. Although input was at one time considered “negligible” (for a recent discussion of this debate, see Rankin and Unsworth, 2016), most SLA researchers now acknowledge the important role of the input in acquisition, in particular with regard to the mapping of form (phonological and morphological representation) with meaning (referents) and function. Flege (2009: 190) articulates this need to observe the input in his call for input studies:

In sum, more and better research will be needed to determine if, as some claim, input is relatively unimportant in L2 learning. To adequately assess the role of L2 input, the input that learners of an L2 actually receive must be assessed more accurately. Measuring L2 input may be impossible, but

better estimates of L2 input can and must be obtained. Doing this will require the expenditure of substantial resources (time, money, creativity). For this to happen, researchers must first decide to *give L2 input a chance* to explain variation in L2 learning.

Ellis and Collins (2009: 329) echo this need:

[...] despite the long-standing recognition of the importance of input in language acquisition, our research base contains little by way of dense corpora studies describing the evidence, particularly of oral input, upon which learners base their analyses for the development of interlanguage grammars.

First exposure studies, whether observing the acquisition of natural or artificial languages, contribute to our understanding of how beginning learners process TL input. The statistical learning paradigm, in particular, addresses how humans learn, and encompassed in this question is how humans learn *language*. Those working on natural languages seek to understand what learners can do at the L2/L3 initial state and how they analyze the linguistic input they receive. Although research on natural languages is the focus of my work, I discuss some results of statistical learning studies in this chapter, where relevant, as they have made an important contribution to our understanding of language learning, especially at the very beginning of this process.

The objective of this chapter is to characterize first exposure studies in SLA and provide an overview of methodologies and empirical findings that are pertinent to research questions raised in Chapter 1, as follows:

1. What is the L2/L3 initial state and what is the role of the L1?
2. What is the nature of the linguistic input, and what role does it play in learner language development?
3. What does the input actually look like in empirical studies L2/L3 acquisition?

The summary of results in this chapter is organized by linguistic domain. We begin with processes involved in initial word learning, from segmenting the speech stream to perceiving morphological marking, and move to morpho-syntax and the building of discourse and information structure. We return briefly to our three research questions from the perspective of first exposure studies and their contribution to issues raised by these questions. This analysis will lead to new and revised questions, hypotheses and methodologies, to be addressed in Chapter 3, which reports on an extensive Pan-European project of foreign language acquisition at first exposure.

2.2 What are first exposure studies?

2.2.1 First exposure: a definition

First exposure studies in SLA are not tied to any particular theoretical framework; rather, they share the belief that in order to advance our understanding of language acquisition processes, we need more precise information about the linguistic input to which learners are exposed. It follows that in first exposure studies data are collected and recorded from the very first moments of exposure to the TL, and participants are learners who have had no prior contact with the TL before the onset of the study, as stated in Rast (2008: 29): “The ‘first exposure’ designation applies to studies in which data are collected from the very first moment of contact with the TL and within the first seconds, minutes and hours of subsequent exposure, and in which all TL input is controlled”. From this perspective, the term “first exposure” in SLA refers to a methodological approach, not a particular theory, model or hypothesis. TLs can be natural or artificial, and both written and spoken forms of language have been studied.²⁶ Learner performance on TL tasks is measured in a variety of ways with respect to “exposure”: 1) upon absolute first contact with the TL; 2) after the first few seconds, minutes or hours of contact with the TL; 3) after a controlled number of exposures to a selection of TL items; or 4) a combination of the above. Learner performance is tested through a variety of means, such as lexical decision, word recognition, grammaticality judgments, sentence repetitions, picture verification and various production tasks, as well as by means of psycholinguistic experiments and measures of neurolinguistic activity (for overviews and collections of first exposure research, see Carroll, 2013; Han & Rast, 2014; Indefrey & Gullberg, 2010). This section reports on a selection of first exposure studies that meet these criteria.

2.2.2 First exposure: History

Before SLA researchers accepted the challenge of fully controlling the TL input to which learners were exposed from the very beginning of the acquisition process, researchers in psychology and psycholinguists, such as Reber in 1967, began to develop artificial languages in order to observe and describe processes involved when accomplishing specific tasks in a novel language. Since Reber’s initial study, other research projects have attempted to control as many variables as possible in the linguistic input by using miniature artificial language input, often statistical in nature (Braine et al. 1990; Gillette, Gleitman & Gleitman 1999; Hudson Kam & Newport 2005; MacWhinney 1983; Mueller 2006; Robinson 2005; Saffran 2001; Saffran et al. 1997; Snedeker, Gleitman & Brent 1999). Depending on the focus of the study, features of the artificial language may or may not be permissible in the participants’ L1 and may be phonological,

²⁶ Gesture has also been studied as a factor in first exposure research (e.g. Gullberg, Roberts & Dimroth 2012). I am unaware of a first exposure study of sign language.

morphological, syntactic or semantic. Experiments are conducted in order to test the learners' performance in the novel language, in particular with respect to these pre-selected features and relative to variables such as working memory, rule learning, generalization, knowledge representation, and other processing and cognitive functions (e.g. Reber 1967, Saffran et al. 1997). The earliest collection of studies specific to the acquisition of artificial languages in SLA research was published in a special issue of *Studies in Second Language Acquisition* (Hulstijn & DeKeyser 1997).

Although the findings of this type of research are often relevant to research in language acquisition, there are limitations. Johnson (2006) points out some fundamental differences between real languages and artificial languages and argues that in order to make them learnable in a short span of time, miniature languages necessarily lack the complexity and variation seen in natural languages. Clearly, the high degree of control comes at a cost of ecological validity. The alternative then is a close examination of the *natural* linguistic input to which learners are exposed.

Singleton and Little (1984) were perhaps the first researchers in SLA to test empirically learner performance in a novel natural language (written in this case) at first exposure, while the study by Zwitserlood et al. (1994/2000) at the Max-Planck Institute for Psycholinguistics (MPI, Nijmegen), inspired by research on the Basic Variety (Klein & Perdue 1992), was the precursor to a series of studies on spoken language in controlled input studies, including Rast (e.g. 1998, 1999, 2003, 2008) and Hendriks and Prodeau (2000) in tutored learners in France, and Dimroth et al. (2006) in untutored learners at the MPI in the Netherlands. These researchers concurred that the best way to study what learners "take in" from the linguistic input (otherwise known as their "intake", see Corder 1967) is to compare the input learners receive with their performance on tasks in the new language. To do this, one must select participants who are unfamiliar with the new language, and then record and measure the TL input provided to them.

Also acknowledging the importance of collecting controlled input data, Susanne Carroll (2012a, 2012b, 2013, 2014; see also Carroll & Meisel 2015; Carroll & Widjaja 2013), director of an extensive research project in Calgary, has produced a series of reports on a first exposure project of English native speakers learning German conducted within the framework of the Autonomous Induction Theory (AIT) (Carroll 2001, 2002). This framework assumes a distinction between domain-specific and domain-general capacities, the former referring to principles and mechanisms devoted to the processing and acquisition of formal properties of human language, and the latter referring to biological and cognitive mechanisms that can be either species-specific or not. A primary element of Carroll's work is her emphasis on distinguishing between input for processing and input for acquisition, that is, differentiating the external input, or rather the

speech that learners hear, from their internalized mental representations (the internal input). The AIT assumes full transfer of the L1 to the L2, and it is these L1 representations that allow learners not only to segment a novel speech stream, but also to do it quickly and accurately (Carroll 2012b). In Carroll's studies, participants were trained on stimuli that were carefully prepared with respect to cognate status (either cognate or non-cognate), word length (target words were either simple or compound), and position of the target items in statements and questions, in addition to other features. Target words were proper names, some of which were cognates and could potentially activate the L1 (e.g. *Braunbart*, literally "brown" "beard", accompanied by a picture of a man with a brown beard). Following training, participants replied to 20 questions about the stimuli. A post-test was conducted two weeks later. The data show that learners were able to rapidly extract words from the novel speech stream and map them to referents, and that cognates were easy to segment and to learn. Word length was not found to have an effect on segmentation or learning, nor was the position of the target word in the utterance found to have an effect on performance.

Initially, first exposure was not a requirement for Carroll's participant pool; however, in her 1999 article, she states in reference to beginning learners of an L2, "I wanted to investigate here the *initial* sensitivity of such subjects to particular types of stimuli on the hypothesis that such sensitivity is revealing about the initial processing procedures they bring to the task of learning the language" (51). It is worth noting that although Carroll's original study was not a first exposure study, she was already asking the important questions about sensitivity to the input that are now being investigated through first exposure research.

Research within the interlanguage (Selinker 1972) interactionist framework has investigated the role of spontaneous input in second language acquisition. A series of studies conducted on a variety of L1-L2 combinations have investigated the relationship between form and meaning at first exposure in both written and oral modalities (e.g. Han & Peverly 2007; Han & Sun 2014; Park 2011, 2014).

Finally, VanPatten and Smith (2015) have also recently conducted a study from a generativist perspective on the acquisition of word order in Japanese by English native speakers who had no previous knowledge of Japanese or any other SOV language at the onset of the study. Their assumption, based on UG theory of acquisition, is that acquisition cannot be simply an internalization of rules because language consists of elements that cannot be learned (VanPatten & Rothman 2014); thus, something else must be going on. VanPatten and Smith (2015) identify three possible scenarios: 1) elements that cannot be learned (UG-given); 2) elements derived from UG that are input triggered, such as parametric variations (e.g. word order); 3) language specific elements learned from the input (e.g. lexicon, inflectional morphology). They investigated whether

grammatical sensitivity (as measured by the Modern Language Aptitude Test) plays a role in parameter resetting.

It is worth noting that most first exposure studies of adult participants are in essence L3 studies in that most learners have studied another foreign language before the onset of the first exposure study in which they participate. In the MPI studies, for instance, Dutch participants all knew English before being exposed to Mandarin Chinese, as is the case with the studies in France where all learners had studied at least some English and many had studied other languages as well. In the Calgary studies, some of the native English speakers exposed to German for the first time already had some knowledge of French. This being said, the L3 aspect has not been the focus of most of these studies. Of the studies discussed above, which focus on learners breaking into the new speech stream, only Rast (2010c) provides an analysis of the first exposure experience through the lens of an L3 study, proposing a highly interactive model for a multilingual learner's psychotypology in L3 acquisition, extending Kellerman's proposal for psychotypology in L2 acquisition (Kellerman 1977, 1979, 1983). In a sentence comprehension task, learners with some knowledge of Russian were more consistently able to correctly translate sentences heard in Polish than learners who had no knowledge of Russian. Rast (2010c) warns, however, that this was a qualitative analysis involving a limited number of participants, so generalizations cannot be made from these results. Rather, the study identifies potential methodology for future research on initial sentence segmentation and comprehension in L3 acquisition.²⁷

2.2.3 Input properties in first exposure studies: transparency and frequency

Transparency (or "cognate status", Carroll 1992) and frequency are two properties of the input that are often controlled in first exposure studies. Transparency (more specifically "lexical" or "phonological" transparency) refers to the degree of similarity between a lexeme in the learner's L1 and the translation equivalent in the learner's L2.²⁸ Studies on transparency investigate

²⁷ Rast (2008b, 2008c, 2008d) also investigated aspects of the multilingual speaker-hearer. These studies investigated the multilingual's ability to discriminate accent in a non-native language (English). Participants with a variety of background languages heard words pronounced by a native speaker of American English and a native speaker of British English (from England). They were asked to identify whether the accent was American or British. Results showed that participants' ability to discriminate accent was closely linked to proficiency level in English (i.e. those with higher proficiency discriminated better than those with lower proficiency) and suggested that participants' L1 may affect their ability to discriminate accents in English. These studies also investigate the essential questions needed in background language questionnaires and how responses to these questions can be quantified and used to measure effects in performance in a given language. In terms of first exposure, these studies contribute to enhancing the methodology used to describe the language background of learners in L3 acquisition research.

²⁸ Transparency can also refer to the degree of similarity between a learner's L1 and L2+ (L3, L4, etc.) or between the TL and any given background language (Rast 2008; Rast 2010c)

whether this similarity aids learners in processing the novel input and eventually in acquisition, and if so, how and under what conditions (Carroll 1992, 2004, 2012b; Han & Peverly 2007; Han & Sun 2014; Rast 2008, 2010a, 2011; Rast & Dommergues 2003).

Frequency effects are also often measured in first exposure studies, although various measures of frequency are used, making it difficult at times to properly compare results. Frequency is at the core of usage-based approaches and statistical learning paradigms. In both cases, frequency is measured in terms of transitional probabilities and statistical regularities (for more detailed information, see Saffran, Newport & Aslin 1996). With respect to the acquisition of natural languages, although Rast (1998) reports frequency effects in her exploratory study of the early stages of L3 acquisition, the criteria for “frequency” were only in the process of being established in SLA. Refining her study and building on a range of studies in the emergentist perspective (Ellis 2002; Goldschneider and DeKeyser 2001; Hintzman 1988; Trueswell 1996), Rast and Dommergues (2003) and Rast (2008) assigned the “frequent” category to words that occurred more than 20 times in the input; many target items were in fact much more frequent than this. Shoemaker and Rast (2013) assigned the category “frequency” to words with at least 4 exposures, again noting that many target items occurred in the input more frequently. For Gullberg, Roberts and Dimroth (2012), “frequent” refers to exactly 8 instances of the word. Carroll (2012) and Carroll and Widjaja (2013), on the other hand, measure frequency relative to how many instances are needed to “learn” the word. In some cases this may be one instance and in others as many as sixteen. In Han and Peverly’s (2007) study on written input, the effect of frequency was observed when words appeared at least 4 times in a reading passage.

2.3 Input at first exposure and linguistic domains²⁹

2.3.1 Perception, segmentation, word recognition

Extracting sound-meaning mappings from the speech stream and learning them is, without a doubt, at the heart of learning a new language. For this reason, word learning is currently the most prominent area of investigation in first exposure studies. How do learners extract sounds from the TL stimuli they hear to build words, and how do they attach meaning to these word forms? In essence, what do segmentation, word recognition and learning on the one hand, and mapping form and meaning on the other, entail?

²⁹ This section is inspired by the many fruitful conversations I have had over the past two decades with colleagues devoted to work on first exposure studies, namely Susanne Carroll, Christine Dimroth, Marianne Gullberg, ZhaoHong Han, Henriette Hendriks, Marianne Starren and Marzena Watorek. I thank them sincerely for their insights and for these enlightening and invigorating discussions. I also thank fellow VILLA members, all of whom contributed in some way or another to these conversations.

Following Carroll (2013), we understand a “word” to be a sequence of speech sounds, combined in such a way that the hearer of the word can map meaning to the sound sequence. Saussure (1916/1995) identified the arbitrariness of language and proposed the signifier-signified paradigm to explain sound-meaning correspondences. From this perspective, word learning involves learning to identify phonological elements in the speech stream (elements of the signifier), segmenting these elements and mapping them to meaning (recognizing what is meant, or rather, what is “signified” by the sound sequence). This process holds for all aspects of word learning, including learning that a particular sound sequence signifies a word stem, to which other sounds can be added (morphemes) in order to create new meanings or to modify the grammatical nature of the word.³⁰

This section briefly introduces a selection of studies on artificial languages that are relevant to word learning in first exposure studies in SLA before entering into a more detailed presentation of studies focusing on how learners break into novel natural language systems in tutored and untutored settings.

2.3.1.1 First exposure to artificial languages: segmenting the speech stream

As mentioned in the previous chapter and above, statistical learning studies have used artificial languages to address questions about speech segmentation. Such studies, often referred to as “incidental” learning studies, are interested in a full control of the linguistic input to the listener in order to understand the psycholinguistic processes involved in perceiving and eventually learning speech sounds and patterns.³¹ In these studies prosodic cues to word boundaries are often removed (e.g. pause, pitch variation, changes in syllable duration) to test whether hearers are sensitive to recurrent statistical regularities. Saffran, Newport & Aslin (1996), for instance, claim that word segmentation from continuous speech is a requirement for language acquisition, and certainly for initial language acquisition. As a result, the authors propose a mechanism that computes transitional probabilities based on whether sounds follow one another word-internally or across word boundaries. Saffran et al. (1997) went beyond this to investigate incidental learning through word segmentation, assuming the existence of a computational mechanism. In the experiment, children and adults were asked to create computer illustrations. While doing this, they heard unsegmented streams of artificial language in the background (e.g. *bupadapatubitutibudutabapidab*), and they were *not* told that these sounds were “language”. They were then tested on a listening task comprised of words (e.g.

³⁰ See Carroll (2013) for a detailed overview of word learning in the early stages of L2 acquisition.

³¹ Much work has been conducted on the perception of written language as well as pointed out by Frauenfelder and Tyler (1987).

babupu) and nonword foils (e.g. *batipa*), during which they were asked to indicate which sounds seemed more like the tape they had heard. Both children and adults performed well on the experiments, suggesting that a statistical learning mechanism, what Saffran and colleagues refer to as “transitional probability computation”, can operate incidentally. These results provide strong support for cognitive, usage-based theory, in that they report evidence of the cognitive ability of participants to make use of these probabilities to accomplish a task in an unknown artificial language.

Work in neurolinguistics has also begun to investigate the early stages. For instance, de Diego-Balaguer and Lopez-Barroso (2010) report on a series of studies using artificial languages in the early stages. In an investigation of the role of prosodic information in participants’ ability to extract words and rules from the speech stream, they observed that the presence of prosodic cues modify the brain responses associated with segmenting the speech stream. As hypotheses on the anatomical sources for various effects are finding increasing support, research in this domain promises to contribute significantly to our understanding of speech segmentation and how it relates to rule formation and executive functions of the brain.

2.3.1.2 First exposure to natural languages: segmenting the speech stream

Sacrificing some control while increasing ecological value, recent studies have investigated how learners break into the novel foreign language speech stream in the acquisition of natural languages and how they process this new TL input.

Studies on the so-called Basic Variety (BV) were some of the first to examine what learners actually do with their ambient linguistic input (Perdue 1993). As mentioned in Chapter 1, the BV is essentially an early learner variety identified in cross-linguistic production data from untutored adults (Klein & Perdue 1997; Perdue 1993), described as a simple, efficient and well-structured language variety. The BV provides evidence that principles of discourse organisation, independent of the specifics of both the source language and the target language, constrain how speakers arrange items in an utterance (e.g. Carroll & Becker 1993; Dimroth & Starren 2003; Klein & Perdue 1997; Starren 2006).

Although most of the studies of the BV and the pre-BV focus on how learners structure information (see the sections in this chapter on morpho-syntax and discourse), Bremer et al. (1996) investigated processes of comprehension in the ESF project. Working within the LV framework, they point out and highlight the importance of interaction in building one’s ability to comprehend a foreign language. Comprehension solicits the active participation of the learner. With respect to word learning, Bremer and colleagues note that problems of the lexical type in interaction are not particularly problematic because learners can

request a definition of an unfamiliar word. This observation, however, leads us back to first exposure and the true beginner. How does a learner extract the “word” from the speech stream in order to be able to process it for meaning?

First exposure research at the Max-Planck Institute for Psycholinguistics, The Netherlands

Working within a functionalist/emergentist approach and in line with the objectives and theoretical framework of the ESF project, research carried out at the MPI opted for a less natural learning situation than the ESF project in favor of more control. The first of these studies, Zwitserlood et al. (1994/2000), investigated initial exposure (15 minutes) to Mandarin Chinese by native speakers of Dutch. The objective of the study was to discover under what conditions learners could recognize certain elements in the TL input and attribute meaning to them. Results showed that the frequency with which words were used by the Chinese native speaker, in conjunction with the use of visual highlighting, had an effect on the recognition of words and their meaning. In addition, they found that participants were able to categorize as nonwords (i.e. words impossible in Chinese) those items that had correct Chinese segments in an incorrect position in the syllable. Zwitserlood and her colleagues conclude that, “the striking result from our experiments is that our listeners, although in the traditional sense ‘understand’ very little, can detect important regularities of the unknown language on the basis of so little input” (Zwitserlood 1994/2000: 12). They showed that after only 15 minutes of exposure to Chinese their Dutch participants were able to recognize whether or not a combination of Chinese elements constitutes a Chinese word or not.

Dimroth et al. (2006) and Gullberg, Roberts and Dimroth (2012) elaborated the methodology of the Zwitserlood et al. study, again using very small amounts of totally controlled language input. In these studies, participants (native speakers of Dutch) with no knowledge of Mandarin Chinese were exposed to the same seven-minute videotape in Mandarin (a weather forecast). Participants were given no instruction or training, and were simply asked to watch the video. They were not asked to interact with the input, nor were they asked to try to learn something. The objective was not to observe learning, but rather, to observe what adults are capable of doing with a new linguistic system at first exposure. A series of post-exposure tasks were administered. Gullberg, Roberts and Dimroth (2012) report on the results of a word recognition task and a sound-to-picture matching task. Results revealed an effect of frequency for word recognition and an ability to map meaning to word form when disyllabic words were accompanied by gesture. Transparency was not a factor in these studies in that no cognates were present in the input. Participants were therefore capable of extracting useful information from a novel speech stream despite the fact that no meaning could be attached to the lexical items in the stream.

In another study from the same data collection, Gullberg et al. (2010) also found that participants were capable of extracting possible Mandarin word forms, again after only 7–14 minutes of exposure to the audio-visual input in Mandarin Chinese. They also found that participants could extract possible phonotactic constraints, and that with gestural support they were even able to extract sound–referent pairings. Based on an exploratory neural connectivity analysis using fMRI, results provide evidence of pre-existing and learning-induced neural differences between learners who were more or less successful at word recognition after only 14 minutes of exposure to the novel language.

Ristin-Kaufmann and Gullberg (2014) replicated the Gullberg, Roberts and Dimroth (2012) study, this time using the same Chinese videotape with groups of native speakers of Swiss-German. They also found that 7 minutes was sufficient for participants to generalize their newly acquired phonotactic knowledge to reject non-words in Chinese.

Taken together, these studies reveal a remarkable capacity in the adult learner to process aspects of the novel TL speech stream after very little exposure to the TL. Results also suggest an important role for implicit learning at the earliest stages of adult language acquisition, at least for processes such as word recognition, which require extracting information from a continuous stream of natural speech. Through careful manipulations of the input, the approach used in these studies allows the effect of selected input properties to be studied in meticulous detail.

Learner varieties - First exposure research at the University of Paris 8, St. Denis, France

Another series of studies investigated language learning in the classroom where a complete control of the linguistic input is possible. This on-going project conducted at the University of Paris 8 on the acquisition of TL Polish by native speakers of French observes the factors that help learners acquire TL words and structures at first exposure and in the few hours that follow. The first of these studies (Rast 1998, 1999), an exploratory study of the first hours of adult language acquisition was inspired by the discovery of the BV (Klein & Perdue 1992) and a first exposure study conducted by Zwitserlood et al. (1994/2000). Although Rast (1998) does not investigate the processes of speech perception per se, she acknowledges the importance of controlling the input, testing learners' knowledge about the TL before instruction begins, and comparing learners' performance in the TL with the input to which they are exposed. While a sentence repetition task was proposed for future research, the study focused primarily on the acquisition of morpho-syntactic structures over 37.5 hours of instruction and will be discussed in more detail in the morpho-syntactic section of this chapter.

Rast (2003, 2006a, 2008, 2010a) and Rast and Dommergues (2003) replicated and extended certain aspects of the Rast (1998, 1999) study with a shorter learning cycle (8 hours of instruction), a tighter control of the linguistic input to which learners were exposed, and a battery of refined tasks in Polish administered at various time intervals in order to observe language development. Data collection took place in spring 1999 with native speakers of French exposed to Polish for the first time ($n = 19$). Methodology and results are reported in Rast (2003) and updated in Rast (2008). Rast (2010b, 2010c, 2011) reports additional findings from this data collection, extending the discussion to new ways of analyzing existing data and to an analysis of the data from the perspective of L3 acquisition. Based on the research conducted by Zwitserlood et al., Rast (2003) set out to observe what adults are capable of doing when first exposed to novel TL input and within the initial hours of exposure that follow, and to observe how they process this input and what variables enhance this processing.

With regards to word learning, one aspect of Rast's (2003) study was to investigate an adult's capacity to recognize the language being learned at first exposure and within the first few hours of contact with the TL. Two separate tests were designed for this investigation, one to test participants' ability to recognize Polish when confounded with utterances in a typologically similar language, Russian. The other test examined the ability of first exposure participants to recognize the difference between two typologically different languages, Mandarin Chinese and Dutch. Learners were administered the first test after 3 hours of instruction and again after 6 hours. The test involved listening to sentences in Russian and Polish. Participants were asked to reply whether the sentence was in Polish or not. In both cases, learners performed at chance, suggesting that 6 hours was insufficient for learners to be able to distinguish the TL from a typologically similar language. Apparently their phonotactic knowledge of Polish was not yet developed enough to be able to decipher the differences between the Polish and Russian phonological systems. A group of first exposure participants with similar profiles to those of the learners of the study were tested on an abridged version of this Polish-Russian test and also performed at chance, suggesting that at first exposure, sensitivity to the phonotactics of the specific languages was not yet in place.

A different group of first exposure participants were tested on their ability to discriminate between Chinese and Dutch sentences. Results of this test confirmed hypotheses that typologically different languages would not pose a problem for recognition, with an overall accuracy rate of 95%. As a reminder, Zwitserlood et al. found that 15 minutes of exposure was sufficient for participants to be able to recognize whether or not a word they heard was permissible in the TL. In other words, participants seemed to gain TL phonotactic knowledge with only 15 minutes of exposure. Gullberg et al. (2010)

discovered that 7 minutes of exposure was sufficient for developing some phonotactic knowledge of the language. These studies focused on word recognition, whereas Rast's (2003) language recognition task focused on specific language recognition based on isolated sentences. Not surprisingly, the language recognition task proved more difficult than the word recognition task for both first exposure participants and learners. The cognitive demand required by processing sentences versus processing words is well documented (e.g. Bates & MacWhinney 1987). The difference in performance on the two tasks underlines the importance of considering results relative to the specific task participants are asked to perform. The results discussed here suggest that even though research has shown that adults can quickly gain knowledge of new phonotactic systems, this does not mean that they can necessarily make use of this knowledge in the context of a continuous stream of natural speech.

In order to observe with more precision how learners break into the speech stream and initially segment the stream of sounds and extract information, two variables were held constant in analyses of the data collected from the classroom input to French learners of Polish in the Rast (2003, 2008) database: transparency and frequency. In order to establish criteria for transparency, a French native speaker control group was administered an oral word translation test while another control group was administered a written word translation test. The instructions were to listen to or to read words in a language they did not know and translate the words to the best of their ability into French. Based on percentages of correct translations, words were categorized as "opaque" (rating of 0% correct translations), "fairly transparent" (rating of 1-50%) and "very transparent" (rating of 51-100%). Rast (2006a) provides detailed results of the translation test.

The variable "frequency" in the Rast (2003) database refers to the number of times a word appeared in the instructor's Polish input in the classroom. All the input was transcribed using the CHILDES format (MacWhinney 2000) and analyzed using its programming tools, resulting in frequency scores for each word in the input. The following categories for frequency of a word in the input were adopted: "absent" (0 tokens), "rare" (1-20 tokens), "frequent" (21-600 tokens).

Keeping in mind these two variables, transparency and frequency, as new variables were added to new studies, Rast (2003, 2008, 2010a) and Rast and Dommergues (2003) report on a sentence repetition test designed to observe learners' ability to repeat TL sentences and the factors that help them with this task (based on Klein 1989). In addition to predicting transparency and frequency effects, they also predicted that overall hours of instruction, word length (measured in syllables), word stress (stressed or not stressed), phonemic distance (based on a French-Polish phonemic comparison), and position in an utterance (initial, middle or final) would potentially affect learners' performance

on the sentence repetition task. This task was conducted with French native speaker control group participants ($n = 8$) who had had no prior exposure to Polish (hence first exposure) and with learners ($n = 8$) after 4 hours and again after 8 hours of instruction.³² Participants listened to sentences in Polish recorded by a native speaker and were asked to repeat the sentences as best they could. Results revealed an important role of transparency in word learning, in particular in extracting words from the input and repeating them. Learners' processes of perception and reproduction were aided by other factors as well, such as stress, familiarity with TL sounds, and utterance position. On the other hand, no effect of word length was found, and while frequency did not show an immediate effect on sentence repetitions, it did show an effect after 8 hours of exposure, with frequent items repeated more accurately than infrequent ones.³³ In sum, substantial evidence of L1 influence was found in the areas of phonemic distance and lexical transparency. Word position (unrelated to L1 influence) also influenced correct repetitions, suggesting that learners relied not only on prior linguistic knowledge but also on other cognitive factors to accomplish the novel TL task.

Rast (2011) reanalyzed the sentence repetitions, this time examining the effects of the controlled variables of word stress, word length and position of the word in the sentence on words that were *not* repeated by participants. Results generally confirmed those found when analyzing correct repetitions. More unstressed words were *not* repeated than stressed words, no overall significant difference in word length was found, and more words in medial position were *not* repeated than words in initial and final positions. In sum, these results, combined with the correct repetition results, reveal that word stress and position played an important role in whether or not participants repeated words in the sentence correctly or not at all. Word length, however, appears to have played little to no role. A post-hoc analysis showed that before exposure to Polish, more 0-1 syllable words were *not* repeated than the longer words, a result that differs slightly from the original sentence repetition results (Rast & Dommergues 2003) in which no effect of word length was found, even in the first

³² A sub-group of 8 participants represents the "monolingual" native speakers of French who attended all the Polish classes.

³³ Sentence repetition data from Rast's (2003) study were also used to investigate the creation of a network using computer software. Roda, Rast and Stojanov (2010) analyzed the data to begin to model how, as learners' knowledge of the new language increases, the effects of perceptual saliency are integrated with semantic values. This research was based on theories of attention that postulate a two-phase mechanism in which stimuli are first quickly scanned for possible relevance, and then further analyzed for more specific properties such as referential meaning. Once trained, the network could be used to evaluate the likely responses of participants to sequences of sentences that resemble those used for training. Other variables that can contribute to measuring the effects of semantic value in sentence repetition experiments, such as results of a translation task, have not yet been applied to the network.

exposure control group data. Given that 0-1 syllable words were all functional (without content), this slight difference in results may suggest that content words are privileged in initial processing. The results of transparency and stress corroborate this hypothesis as well as the fact that most transparent and stressed words were content words, and most were more successfully repeated than nontransparent and unstressed words.

Rast (2010a, 2010b and 2011) also analyzed translations of the sentence repetition test described above by first exposure control groups of native speakers of French with similar profiles to those of our learners ($n = 9$). Participants listened to the sentences in Polish and were asked to translate them into written French as best they could. Some results were found to be in line with the results of sentence repetitions conducted at first exposure to Polish. In the sentence translations, no unstressed words, whether content or grammatical, were translated correctly. Some differences were also found. Results for the role of phonemic distance were quite different from the repetition results. Whereas phonemic distance played an important role in repetitions at all time intervals, it did not appear to play a role in translation at first exposure. Unlike results on the sentence repetitions, word length was found to play an important role in sentence translation at first exposure; the longer the word, the more likely it was to be correctly translated. In terms of position of the word in the sentence, words in final position were translated more accurately than words in initial or medial position.³⁴

These results, taken together, highlight the importance of considering the task at hand when measuring variables that may or may not help learners process the input to which they are exposed. Reflecting on how input can become “intake”, and given findings that reveal different effects of the same variables on learners’ performance in the TL relative to the task, Rast (2010b: 112) builds on the recommendation expressed in Rast (2010a) and calls for research to provide more precision regarding the stages of intake (i.e. on a continuum from preliminary to final intake during learning, see Chaudron 1985) and types of intake (i.e. the language activity involved):

No intake when the item is *not* perceived, comprehended or (re)produced;

Intake of various types:

The item is perceived, but it is neither comprehended nor (re)produced;

³⁴ Surprised by this finding, Rast (2011) examined the interaction between position and transparency and found a strong interaction. Indeed, more transparent words appeared in final position than in other positions. While these results corroborate the strong role attributed to transparency in sentence processing, they also falsify the results found concerning the role of position in the sentence translations, and by extension in the sentence repetitions. Further tests with a more balanced distribution of transparent items across sentences would be necessary.

The item is perceived and (re)produced, but not comprehended;

The item is perceived and comprehended, but not (re)produced;

The item is perceived, comprehended, and (re)produced.

The category “(re)produced” refers to repetition, spontaneous use, and productive mastery of form-function mappings. The assumption is that intake of all types can, to various degrees, lead to learning.

Finally, Rast (2008, 2010a) reports on a different sentence translation task, one that was administered to the learners of Polish ($n = 8$) at three time intervals, after 1.5, 3.5 and 7 hours of Polish instruction. They were asked to listen to 8–10 unrelated Polish sentences and to translate them into French in the written form. Words in the task were analyzed relative to four factors: basic constituent word order, word frequency in the input, word transparency (based on a French-Polish lexical comparison), and sentence length. Overall results revealed that word transparency and frequency in the input were the two most influential factors for correct translations of a word at all time intervals. Further analyses revealed, however, that these factors showed a significant effect on the translation of some words but not others and that the nature or function of the words, their position in the sentence, and sentence length also played an important role in extracting meaning. In sum, with respect to L2 speech comprehension, while the transparency and frequency in the input play an influential role, successful comprehension is also likely to be dependent on other factors. It is suggested that given that variables naturally interact during all types of language activity, new and appropriate data collection methods need to be developed with a view to identifying a hierarchy of interacting variables that intervene during given tasks, such as segmentation, repetition and comprehension, and at various proficiency levels. This is precisely what future studies would set out to do (see Chapter 3).

With these prior results based on the Rast (2003, 2008) database, follow-up studies at the University of Paris 8 further tested some of these findings with updated methodologies and tools. In one such study (Rast et al. 2014), again in an instructed setting, 6.5 hours of Polish instruction was provided to native speakers of French ($n = 18$) who had no prior contact with Polish or another Slavic language.³⁵ In order to have more control over the type of language activity engaged in by participants and to focus more specifically on word extraction and recognition by alleviating the need for learners to (re)produce orally, Shoemaker and Rast (2013) removed the production portion of the

³⁵ Learners had L2 English and their L3 was a Romance language. Polish was their L4. This research was supported by a grant from the *Programme d'Aide à la Recherche Innovante* (2011–2012), University of Paris 8, St.-Denis, France.

sentence repetition test used in Rast and Dommergues (2003) and Rast (2003, 2008) by designing a purely perceptual word recognition task. During this task, administered at three time intervals, including before the first Polish lesson, learners were asked to listen to a Polish sentence followed by a Polish word, and to indicate whether or not the word was part of the sentence they had heard. The test was run on E-prime (Schneider, Eschman & Zuccolotto 2002). Participants heard sentences in Polish through headphones on a computer and pressed a button to reply. In this way, participants were not asked to produce language during the task. Results confirmed the powerful role of transparency when perceiving speech and extracting words from the speech stream at this early stage. Frequency effects were not found in the word recognition data (Shoemaker and Rast 2013), in line with results of the sentence repetition task reported in Rast and Dommergues (2003) where an effect of frequency was not observed until 8 hours of instruction.

Shoemaker and Rast (2013) also investigated the impact of sentence position on learners' ability to extract words from the TL input. As mentioned above, Rast and Dommergues (2003) and Rast (2003, 2008) had found that, in terms of utterance position, words in initial and final positions were repeated more consistently than words in medial position at all time intervals. Rast and Dommergues (2003) also found that final position was favored over initial position; however, post-hoc analyses showed that this finding was due to an imbalance of transparent words over the three sentence positions, with more transparent words appearing in final position than in other positions. In the word recognition task, Shoemaker and Rast controlled for transparency when designing the task and balanced transparent words across all positions.

Results of the word recognition task with respect to position (Shoemaker & Rast 2013) revealed that words in both initial and final position were recognized more readily than words in medial position, confirming results of prior studies and providing further evidence that prosodic boundaries are highly salient for first exposure learners. Interestingly, words in final position were better recognized than words in initial and medial position, and this without an interaction with transparency, countering the results of Barcroft and VanPatten (1997) that initial position is privileged over not only medial but also final position. Regardless of this difference in results, a finding that is clear in Shoemaker and Rast's (2013) study is that when learners recognized TL words, they did so by means of prosodic cues to word boundaries. Although it is still uncertain what these cues actually are, it is quite amazing that learners could use these cues already at the first time interval (i.e. prior to instruction). It is worth noting that this latter finding suggests that word recognition cannot be explained solely by a statistical learning account. Also, given that input frequency did not have an effect on recognition, it appears that participants did not build lasting

mental representations of individual lexical entries to which they were exposed. Rather they appear to have acquired prosodic or segmental information specific to Polish, which allowed them to better segment the signal. If improvement in recognition between the first and second time intervals were based on the acquisition of individual lexical entries through exposure to input, we would expect frequent words to be recognized better than less frequent or absent words at the second time interval, but this was not the case. The hypothesis that learners have acquired TL specific prosodic and segmental information is further supported by the fact that the recognition of nontransparent words improved regardless of their frequency in the input. Finally, Shoemaker and Rast (2013) reason that working memory may have played an important role in extracting words, especially considering the length of sentences in their study (20-25 syllables). If individuals rely heavily on acoustic memory in the recognition of words, it is reasonable to assume that words in final position hold a privileged position.

The studies conducted on first exposure participants and learners at the University of Paris 8 were the first to record and document all classroom input from the moment of first contact with a novel TL and to compare this input with learner performance. This methodology has opened the way for a new type of meticulous analysis of the TL input and its role in foreign language learning, in particular in instructed SLA. These studies have contributed to our understanding of what helps learners break into a novel TL speech stream, including the role of variables such as transparency, frequency in the input, word stress, word length, position of a word in a sentence, and phonemic distance relative to a learner's L1. All of these variables play a role at one point or another in the early stages of acquisition, with the relative importance of each depending on the task at hand and the amount of exposure.

This section has provided evidence for the number of processes activated during initial exposure to a novel TL. As Carroll (2013: 136) rightly concludes following a summary of studies on word learning: "A reasonable approach to language learning is therefore to assume that learners will draw on the full range of potential cues to word segmentation." In the following section, we consider another aspect of word learning, the acquisition of morphological elements and syntactic structures, providing a glimpse into the acquisition of a new syntactic system.

2.3.2 Morpho-syntax

2.3.2.1 First exposure to artificial languages: morpho-syntax

Reber's (1967) study in psychology was one of the first to investigate the learning of an artificial morpho-syntactic system. He exposed participants to an

artificial syntactic language, a finite-state language constructed with a vocabulary using only five letters (P, S, T, V, X) and a grammar comprised of a set of sentence construction rules. Using memorization tasks, he investigated how participants responded to implicit learning (e.g. participants were unaware that learning was an objective of the experiment). Participants were presented with written stimulus items in the form of sentences under a time constraint of 5 seconds per sentence. One group was presented with “grammatical” stimulus items one at a time, while the other group was presented with randomly constructed items. Participants were then asked to reproduce the sentences in writing, receiving immediate feedback about the correctness of their responses following each training set. As of the third training set, the grammatical item group showed a significant improvement over the random item group. Participants of the grammatical group appeared to learn one item at a time during initial training sets, becoming capable of learning two or three items on a single trial as of Set 3. The random group participants, in contrast, rarely succeeded in correctly reproducing more than one item.

Studies of first exposure conducted by SLA researchers began with artificial languages in which they set out to investigate the learning of new morpho-syntactic systems (Yang & Givón 1997; De Graaff (1997); DeKeyser (1997). They opted to use artificial languages in order to control the input from the moment of first exposure. Yang and Givón studied the first 50 hours of exposure to the artificial language by two groups of native English speakers. One group received “pidgin” input in which grammatical morphology was omitted for 20 hours, followed by fully grammatical input for the remainder of the instructional period. The other group (the “grammar” group) was introduced to the grammar via fully grammatical input from the start. The two groups received the same quantity of input on the computer, and instruction for both groups was implicit in that no grammar rules were provided. Performance tasks consisted of repetition drills, matching sentences with pictures, comprehension tasks accompanying pictures and stories, picture-guided production tasks, and translation tasks in both directions. While results revealed no difference between the groups in the learning of vocabulary, they did show the learners of the “pidgin” group lagged behind learners of the “grammar” group, suggesting that simplifying the input from the onset of acquisition is not necessarily beneficial.

To test the effect of explicit grammar instruction and the complexity of TL structures on L2 acquisition (measured as the number of grammatical concepts needed to correctly process or produce a structure), De Graaff (1997) examined the first 15 hours of exposure to an artificial language by native Dutch speakers. One group received explicit grammar instruction with explanations about grammar rules after each activity; the second received no explicit grammar instruction, but rather, participated in a series of exercises during which they were exposed implicitly to the grammar under investigation. Tasks included

grammaticality judgments, gap-filling, and vocabulary translation. Results showed a better performance for the “explicit grammar” group, confirming hypotheses that explicit teaching of grammar facilitates L2 grammar acquisition. An effect of the variable “complexity” on acquisition relative to the type of instruction was not confirmed however. DeGraff concludes that to better understand the effect of “complexity” in L2 acquisition, one must consider not only the number of criteria needed to process or produce a specific form, but also the semantic saliency of these criteria.

DeKeyser (1997) also developed an artificial language, an agglutinative language with flexible word order to investigate the effect of “practice” on the acquisition of L2 morphology (within the context of the implicit/explicit learning debate – see Chapter 4). After being exposed to vocabulary and grammar rules in the novel language, learners were given electronic practice exercises in written comprehension and production. The total exposure period was approximately 22 hours. Although all participants were taught the same rules and received the same amount of comprehension and production practice, the groups varied in the rules practiced for each skill. Comprehension was practiced and tested using electronic picture – sentence matching; tasks for practice and testing production involved typing the correct sentence corresponding to the picture. Results reveal that the learning of morpho-syntactic rules was task and skill dependent. DeKeyser concludes that, “Overall, our data lend strong support to the hypothesis that practice has skill-specific effect in the sense that performance in comprehension and production is severely reduced if only the opposite skill was practiced” (213).

More recent studies on the learning of new artificial morpho-syntactic systems in SLA research have focused, for the most part, on the implicit/explicit learning debate (see for example Rogers 2016). More information on these will be provided in Chapter 4.

2.3.2.2 First exposure to natural languages: morpho-syntax

As in Chapter 1 and above, a large-scale research program on adult language acquisition identified the Basic Variety (BV) and the pre-BV (Perdue 1993; Klein & Perdue 1997) as early forms of learner varieties. Although this identification was based primarily on semantic and pragmatic analyses, a morpho-syntactic examination of these learner varieties sheds light on how learners process grammatical information in the early stages. A principle finding in these studies is that many pre-BV and BV utterances lack verbs and morphological inflection regardless of SL and TL properties, suggesting that beginning learners with an L1 that shares properties with the language being learned cannot necessarily apply these SL properties to their TL productions (Klein & Perdue 1992). This observation led to a focus on the linguistic environment (input) to which learners are exposed, and the assumption that the input contains the information

needed for principles of organization to inform language acquisition. These organizational principles are part of the array of general cognitive abilities that explain acquisitional processes that are specific to the human mind and body (Klein & Perdue 1992, 1997). First exposure studies have been able to capture this input and observe how learners process this input not only to segment the speech stream for sounds that can be mapped to semantic meaning, but also to extract sound combinations (morphemes) that contain grammatical information, such as gender, number or case.

First exposure research conducted at the University of Paris 8 investigated the acquisition of several aspects of the Polish morpho-syntactic system by French native speakers. The first of these studies, Rast (1998, 1999), used a heuristic approach to experiment with methodologies that could be used to observe what learners are capable of doing when exposed to a novel TL for the first time and within the first hours that follow. The study was methodological in its intent, and results were taken as hypotheses for future research. The study involved the acquisition of Polish by learners of various language backgrounds ($n = 18$) with French as a common background language, the L1 for most learners, but not for all. The Polish course took place over one semester, a total of 37.5 hours of instruction. All classes were fully audio-recorded in order to examine the Polish input to which learners were exposed and a variety of Polish tasks were administered at a variety of time intervals. Exploratory in nature, the study identified hypotheses about constituent word order, the placement of the negative particle and the pro-drop feature in the early acquisition of Polish as a foreign language, while also establishing a methodology to be refined in future studies.

Building on Rast's (1998, 1999) findings, Rast (2003, 2008) sought to better understand how learners work on the input and what constrains their learner varieties. Due to technical limitations, all tasks designed to observe learners developing morph-syntactic systems were in the written modality (written Polish was also used in the Polish lessons). Participants ($n = 19$) were native speakers of French - some were bilingual and some had studied Russian prior to the study. No participants had prior exposure to Polish, the TL of the study. A core group of 8 learners were selected for Rast's (2008) analyses reported in Section 2.3.1.2; they were all monolingual native speakers of French,³⁶ had no prior knowledge of a Slavic language and attended all of the Polish lessons (hence, they were exposed to all of the input). In addition to audio-taping the lessons to document the Polish input and investigate the domains of perception, segmentation and word recognition, Rast (2003, 2008) collected information to

³⁶ The use of "monolingual" here follows Grosjean's (1982) work on bilingualism in which he defines a bilingual person as someone who uses two or more languages on a daily basis. The "monolingual", on the other hand, uses one language on a daily basis, the case of Rast's (2008) eight monolingual learners.

observe how learners fared when asked to do certain tasks in Polish that tested their ability to place words in the appropriate order in a sentence, including the placement of the Polish negator and the reflexive pronoun *się*, and to identify errors of verbal morphology. Three tasks were administered over several time periods to observe performance in Polish at early exposure and development over time: a word order test (learners were presented with scrambled words and asked to put them in the appropriate order), a grammaticality judgment (GJ) test and a written translation of the text used in the GJ test. Different versions of the three tasks were administered after 1.5, 3.5 and 7 hours of Polish instruction (Rast 2008, 2010a).

Taken together, results show unstable constituent word order at the first test time, with SVO becoming the preferred order by the second test time and remaining stable. With respect to negation, learners appeared to formulate individual hypotheses about the placement of the Polish negator *nie* and consistently held to their hypothesis across test items, with the exception of one learner. At the first test time, four working hypotheses for the position of *nie* were identified: pre-verbal, post-verbal, sentence-initial and sentence final. Two learners posited the post-verbal hypothesis, the only hypothesis that follows the structure of the learner's L1 French, indicating that L1 transfer alone cannot fully explain this early performance. After two additional hours of exposure, seven of the eight learners placed *nie* in its appropriate pre-verbal position in the word order test.

The learners' placement of the reflexive pronoun *się* relative to the verb posed problems for interpretation (Polish attests both pre-V and post-V structures). Results suggest an important role for the frequency of word order in the input (*V-się* was more frequent than *się-V*) in that most learners showed a preference for the *V-się* order. Frequency may have played a reinforcement role in which the input provided a strong cue to learners that the structure V-O is permissible where *się* occupies the object slot. This cue is in contrast to an exception in French syntax whereby French object pronouns can appear before the verb as in *Elle le sait* (S-O-V, "She it knows"). Finally, analyses of verbal morphology errors in the GJ test revealed a strong sensitivity to TL inflectional morphology after only 1.5 hours of exposure to Polish. These results will need to be confirmed with tests of online aural perception in the first hours of exposure.

Concerning the acquisition of a novel system of nominal morphology, Rast (2006a, 2008) discovered a remarkable sensitivity to nominal morphology at first exposure when analyzing the data of the translation test used to measure transparency in the study. The first exposure control group participants (not learners) were asked to listen to a list of words in Polish and translate them as best they could. Results reveal that in their translations, participants made decisions based on features of the language into which they were translating, in this case French. Participants appeared to search the Polish word for information

that must be coded in the French translation equivalent, such as in the word for “student”, which in French must be marked for gender (*étudiante* –feminine; *étudiant* – masculine). Data show that some participants were particularly inclined to interpret word endings as indicators of gender or number (e.g. *kolega*-nom.m.sg was misinterpreted as feminine; *kolegi*-gen.m.sg was interpreted as plural). Given the extensive amount of L2 acquisition research suggesting that learners do not attend to morphology at the early stages (e.g. VanPatten 1996, 2004, 2007), this finding offered new insights into what learners are capable of doing and actually do in the early stages of TL acquisition.

In an exploratory pilot study of 4 first exposure learners of Polish, Rast, Watorek and Hilton (2010) set out to experiment with new methodology that would test Rast’s (2003, 2006a, 2008) finding that in spite of research showing little to no functional morphology at the very beginning of L2 acquisition (Bardovi-Harlig 1992; Klein & Perdue 1997; Starren 2001; VanPatten 2004), some sensitivity to form seems to be present from the very beginning. The authors were interested in knowing when and why learners are sensitive to morphological marking, why some learners are more sensitive to morphology than others, and at what point learners are able to generalize L2 morphological rules. A partial replication of Rast’s (2008) study, the pilot study differed from the original study in that all classes were not only audio-recorded, but also video-recorded and that the Polish instructor used Polish only, never reverting to L1 French for explanations or to reply to students’ questions. The Polish classes totaled 13 hours of Polish input over one semester. Performance data were collected at several intervals by means of an aural and written grammaticality judgment (GJ) test, a picture-matching test, and a brief interview. All test items were also controlled for frequency in the input and transparency relative to all L1s and L2s known to the learners. Participants comprised a heterogeneous group of bi- and multi-linguals; L1s included French, Arabic, Berber and Portuguese, and all participants had advanced level French and intermediate to advanced English.

The linguistic focus in the GJ tests was nominal morphology. Polish attests seven cases, two number classes, three gender categories, personhood, and animacy); none of the L1s or L2s of our learners show such morphological complexity. The aural GJ test controlled for gender and case as in the following examples:

Correct (gender):

Maria jest francuzką

Maria is French (feminine)

Incorrect (gender):

*Anna jest *studentem*

Anna is student (masculine)

Correct (case):

student zna angielski

student knows English (accusative)

Incorrect (case):

*student zna *angielskiego*

student knows *English (instrumental)

Participants were asked to listen to the sentences and indicate whether the sentence is correct in Polish or not. The same test was administered at four time intervals: after 3, 8, 9 (following a two-week break) and 13 hours of Polish instruction.

Given the small number of participants in the study, no statistics were generated. Based on raw accuracy scores, however, results show that learners performed near chance and that no noticeable development took place. In line with the majority of research on the acquisition of L2 morphology, results confirmed that errors in morphology were difficult for learners to detect. They did not confirm Rast's results that some sensitivity to morphology is present in the early stages. In their discussion, Rast, Watorek and Hilton (2010) highlight the difficulty of the test items for learners with such little TL exposure and suggest that their methodology is not yet fine-tuned enough to fully access information about what early learners can do with this type of TL task, i.e. judging the grammaticality of short sentences. Their recommendation for the future was to make some adjustments to sentences in the test, following even more closely the input provided by the Polish instructor, that is, balancing items in the GJ test more equally relative to frequency in the input and looking more closely at the context in which relevant sentences were produced in the classroom input.

The study also analyzed accuracy with respect to frequency in the input and transparency. Results show that transparency and frequency made little difference at the beginning, but that after 13 hours of exposure, frequent and/or transparent items were more likely to be identified properly as either correct or incorrect in Polish by learners. The difference at 13 hours is clear: sentences with frequent and/or transparent target words received correct responses (66%) more than sentences without frequent or transparent target words (44%). This suggests that variables generally considered beneficial for processing, such as frequency and transparency, take time to become useful, in line with Rast's (2008) findings.

Rast, Watorek and Hilton (2010) also report on results of the written GJ test administered to the same group of four learners. A short text based on information from the Polish lessons contained several errors of nominal morphology, case and gender as in the aural test. Learners were asked to read the text and to find and correct the errors. Following the test, they were asked to translate the text for the purpose of verifying their comprehension. The same test was administered after 4.5 and 13 hours of Polish instruction. The authors conducted a qualitative analysis of how each learner responded to each error and made several observations. After 4.5 hours of exposure, some learners were

able to find and correct some of the errors, some development was observed between 4.5 and 13 hours (in particular for one of the learners), and individual learners differed quite drastically in their performance.

Finally, Rast, Watorek and Hilton (2010) reported results of a pilot picture-matching task, again with the same four learners. Morphology for L2 learners is often viewed as fairly unimportant given that learners find alternative ways to communicate in the absence of knowledge about morphology (e.g. Starren 2001). This view inspired Rast, Watorek and Hilton to test learners' sensitivity in a context where morphology is crucial to comprehension. In the picture-sentence matching, learners saw two images (A and B) while listening to a sentence and were asked to indicate whether the sentence corresponded to image A or B. All sentences had two versions (SVO and OVS), both of which are possible in Polish. It is the noun suffix (nominative or accusative case) that indicates to the listener whether the noun is the subject (agent) or the object (patient/receiver) of the utterance. Verbs were chosen to create sentences that respond to the question "Who does what to whom?" (Bates and MacWhinney 1987), for example:

1. *brat pcha siostrę*
brother (Nom) pushes sister (Acc)
(Brother pushes sister.)
2. *brata pcha siostra*
brother (Acc) pushes sister (Nom)
(Sister pushes brother.)

The test was administered after 3 hours and again after 13 hours of Polish instruction.

Following extensive research conducted by Bates and MacWhinney (1987) and others, including Rast (2008), it was predicted that learners whose L1s and other L2s show SVO word order would interpret OVS sentences as SVO. This prediction was borne out. At close to 100%, OVS sentences were interpreted as SVO, suggesting that learners relied on word order rather than morphology to interpret the sentences. This highlights the important role that knowledge of nominal morphology (or lack thereof) can play in the early stages of L2 comprehension and has implications for language teaching (see Chapter 4 for discussion).

Finally, in brief interviews conducted with the learners at the end of the 13-hour Polish course, evidence was found of learners attempting to use Polish morphology as in the following example:

- INT: *a ten pan # kim jest?*
this man # who is he?
- NC: *aktorka # [//] akto aktorem*
actor.FEM # [//] acto actor.MASC

Taking the findings of these studies together, the authors conclude that learners at the initial stages can notice, judge and even make use of morphological marking under certain conditions. Better performance was found in judging written forms over aural forms, and attempts at morphology could be observed in a production task more easily than in a receptive task, such as the aural GJ test. This last observation became the focus of future studies in the acquisition of TL morphology (e.g. Hinz et al. 2013; Rast et al. 2014; Watorek, Rast & Hilton 2011), as did the question of learners' ability to generalize patterns to novel TL items and structures. No evidence for an ability to generalize this early was found in the current study. The finding that learners differ in their processing of morphological marking, also observed in Rast (2008), led the research team to consider collecting information on learner variability in future studies via a battery of psychometric tests, surveys and questionnaires (e.g. Hilton 2011b; Rast et al. 2014).

Following Rast's (2008) input study and the study conducted by Rast, Watorek and Hilton (2010), another study of the acquisition of Polish by adult native speakers of French with no prior contact with Polish or another Slavic language ($n = 14$), Watorek, Rast and Hilton (2011) sought to better understand the effects of two different treatment types on the acquisition of Polish nominal morphology (note that Polish nouns can be marked for seven cases, three genders and two plurals). During the 9th lesson, the objective of the lesson was to teach learners how to describe dynamic and static space (e.g. "turn into the street", "the museum is in front of the hotel"). The study used DeKeyser's (1995) distinction between implicit (focus on meaning) and explicit (focus on form) treatment types. In the implicit condition, the instructor used no metalanguage or explanations of grammar rules, no tables or lists of grammatical forms, and no highlighting. In the explicit condition, the instructor used metalanguage and grammar explanations in Polish as appropriate for the level, tables and lists of grammatical forms, and highlighted written text. The two tasks were administered at the end of the 45-minute lesson (after a total of 11 hours of Polish instruction). Results of the grammaticality judgment task showed a higher accuracy rate for the explicit group than the implicit group; however the explicit group was not more successful at generalizing rules to novel items. The two groups showed similar scores on the sentences that contained novel items. Results of the production task showed that the explicit group also produced more complex morpho-syntactic structures, but there was no difference in the number of utterances and items produced by members of the two groups. In sum, confirming Norris and Ortega's (2000) meta-analysis that learners do better with explicit/focus-on-form instruction, the study argues in favor of explicit treatment for better performance on TL judgment and production tasks. Interestingly, very few idiosyncratic nominal forms were produced by learners of either group, unlike findings for unguided acquisition where idiosyncratic

forms are quite common (Watorek 2008). Finally, even though the groups differed in the accuracy of their productions, this did not affect their ability to communicate effectively; that is, the productions of the implicit group members, even with incorrect nominal morphology, met the communicative requirements of the task. This supports findings that even though beginners develop morphology late, their productions are efficient in terms of communication (Starren 2001; Bardovi-Harlig 1992, 2000).

Based on Rast (2008) and subsequent studies that provide evidence for learners' sensitivity to inflectional morphology in the early stages of foreign language acquisition, Rast et al. (2014) conducted another study to investigate what helps learners perceive and use inflectional morphology in the early stages. The study made use of the same Polish input database reported in Shoemaker and Rast (2013) (see Section 2.3.1.2 above), in which lexical transparency (transparency vs. opaque) and frequency in the input (present vs. absent) were carefully controlled and measured. Participants were all French native speakers learning Polish from first exposure ($n = 18$).³⁷ This time, an aural grammaticality judgment (GJ) task and an oral question-answer (QA) task were designed to test learners' performance with respect to the same Polish feature, nominal morphology, in particular markers of gender (masculine and feminine) and case (nominative and accusative). The GJ task was administered after 1.5 hours of instruction and again after 4 hours of instruction (immediately following the lesson, and again the following morning before the next lesson). Participants performed the QA task after 2 hours and 45 minutes, and again after 6.5 hours. Results of overall accuracy show improvement between the first and last test times for both tasks. Frequency was found to help learners in both tasks at all times. Transparency offered a more complex story however. In the GJ task data, a significant effect of transparency was found after 4 hours of instruction, but not initially after 1.5 hours. Performance on transparent items was better than on opaque items after 4 hours of exposure. Although the ability to judge transparent items improved over time, this was not the case with opaque items. No improvement was observed, which indicates that learners were not able to generalize Polish noun ending patterns to new lexical items. Interestingly, the QA data offered only a slight indication that transparency may have helped learners produce Polish words with appropriate morphological markers, but this finding was not significant. Surprised by this result given the strong effect of transparency found in the Rast and Dommergues (2003) data, the research team decided to revisit the methodology and the test items in these two tasks. Chapter 3 describes data collected using new versions of these tasks.

A study in the domain of syntax (L3 acquisition) was also conducted at the University of Paris 8. Hendriks and Prodeau (2000) looked at the acquisition of

³⁷ This group had no knowledge of Polish or another Slavic language, their first L2 was English and their L3 was a Romance language. Polish was their L4.

Dutch finite verb placement in French learners of Dutch with or without prior knowledge of German as a foreign language. The authors found that, whereas all learners received the exact same input in which evidence for the verb placement was sparse, only those with prior knowledge of German (i.e. the learners of Dutch as an L3) discovered the target verb placement rule. These results are in line with Rast's (2010c) finding that knowledge of a typologically similar L2 can aid the acquisition of L3 morpho-syntactic structures.

2.3.3 Information structure (discourse)

How learners structure information in their discourse is central to the LV approach to language acquisition (Perdue 1993; Dimroth & Starren 2003; Hendriks 2005). First exposure studies in this domain, however, are virtually inexistent because of the recognition that learners need to have a certain amount of TL knowledge intact before they can engage in discourse intended for comprehension by a speaker of the TL. Given that principles of information structure are currently not the focus of statistical learning studies, artificial languages are not created for this purpose.

Some people, in fact, might think that studying information structure in communicative discourse at first exposure to a new TL is an oxymoron. How can someone interact in the new TL without knowledge of the new lexicon? As argued above, however, learners, especially adults, come to the acquisition process with quite a lot of knowledge, both linguistic and other, and much of this is useful knowledge in the acquisition process. From the LV perspective, learners gradually acquire the means to organize an utterance in the TL for purposes of comprehension and production. Depending on the demands of the concept to be uttered or comprehended, the learner may or may not have the means for a successful attempt at communicating. Certain means appear to be acquired quite rapidly, as is witnessed by the communication that often occurs rather quickly in a beginning language course when students are taught how to introduce themselves. Research conducted on adult learner varieties in an untutored setting (ESF project, Perdue 1993) investigates the processes involved in real-life contexts. Klein and Perdue (1992, 1997), for instance, claim that syntactic structures found in a learner's utterances are a result of the learner's attempt to organize information with the linguistic means available in a way that signals the appropriate function or relationship between constituents of the utterance and/or preceding utterances (e.g. maintenance of an entity, scope domain, and motion events). The question is then, at what point in the process can learners begin to structure their own utterances? Can they begin to do this in the first few hours of exposure if they are given the linguistic means to do so? And if they can, what will they do? What will the initial variety look like? As Dimroth (2013: 3257/2) points out, "Advocates of the LV approach emphasize that learner utterances are structured according to certain organizational regularities right from the beginning of the acquisition process". As described in Chapter 1,

evidence of this has been provided in the form of analyses of a Basic Variety (BV) and a pre-BV in the beginning stages of adult untutored language acquisition. Principles of utterance structure identified by Klein & Perdue (1992, 1997) and colleagues originated from analyses of early productions. This discovery was particularly important because the early productions documented by the ESF project are some of the earliest meaningful productions we find in SLA databases.

Rast (2003) collected production data from learners after 8 hours of Polish instruction based on a task used in the ESF project, the retelling of a short excerpt of a film. After a preliminary analysis of these data, a decision was made not to invest further time on these data given that they provided very little interesting information because of the difficulty of the task. It was decided that future research would need to identify production tasks appropriate for this very initial stage of foreign language acquisition, setting up an exciting challenge for the future VILLA project, presented in Chapter 3.

2.3.4 Conclusion: empirical findings

Results of first exposure studies discussed above provide several indications about future research. With respect to initial segmenting of the speech stream, word recognition and word learning, results reveal inconsistent frequency effects. The series of studies conducted at the University of Paris 8 indicate that 6 hours of overall exposure to the novel TL is insufficient for learners to distinguish phonological differences between the TL and an unknown typologically similar language. Likewise, no frequency effects were observed in sentence repetitions after 4 hours or 6.5 hours of exposure. At 8 hours, however, an effect of frequency was observed, with frequent words repeated better than words that were absent from the input. Sentence repetition and word recognition tasks both showed robust effects of transparency; transparent words were repeated and recognized better than opaque words. These results suggest that first exposure participants were able to extract words from the unfamiliar speech stream. They also suggest that frequency and statistical learning alone do not provide a satisfactory explanation for this ability to extract words from a novel speech stream. In contrast, in translation tasks frequency played an important role immediately, after only 1.5 hours of exposure to Polish, as did transparency at first exposure and within the hours that followed.

Results from the University of Paris 8 studies in the domain of morpho-syntactic reveal strong frequency effects at all time intervals and for all tasks, the earliest being after 1.5 hours of exposure. Sensitivity to Polish morphology was also observed in many tasks, both oral and written. An effect of transparency was found in grammaticality judgments after 4 hours (not after 1.5 hours), but was not found in simple productions at any time interval.

Looking at the results more closely, we note that for segmentation, frequency effects are inconsistent whereas transparency effects are regularly strong. In contrast, in accurately judging and producing inflectional morphology, frequency plays a consistent role, whereas transparency does not. These results highlight once again the need to attribute factors that aide acquisition to specific tasks. One factor may be invaluable for speech perception, whereas another may play a minimal role.

2.4 Individual differences

Although the interface between individual differences and language learning has been studied for decades (e.g. Carroll 1981), this study has only recently come to the forefront in SLA research (Dörnyei 2005; Robinson 2002; Skehan 1989). And even more recently studies are beginning to measure individual differences in first exposure participants relative to their performance in a “natural” TL (e.g. Han & Liu 2013; Hilton 2011b; Hinz et al. 2013; Rast 2006b, 2008; Rast et al. 2014; VanPatten & Smith 2015).

Two case studies in Rast’s (2003, 2008) project of French learners of Polish, Rast (2003, 2006b, 2008) observed the performance and development of two learners at first exposure to Polish and over 8 hours of instruction. The principal objective of this study was to compare how two learners, Gilles and Luc, with quasi-identical profiles (based on responses on the learner profile questionnaire), interpreted the Polish input provided to them as measured by their performance on Polish tasks over time (for additional analysis, see also Rast 2012). Both were monolingual native speakers of French who had studied English in the French public school system. Neither had any knowledge of other foreign languages. Both were male, aged 26-27, and raised in Paris in similar socio-economic conditions by French-speaking parents. If transfer from a learner’s L1 (French in both cases) and/or the TL input to which the learner is exposed (Polish in both cases) are the primary factors driving L2 acquisition processes, then we would expect to see similar performance in the data collected from these two learners. This was not the case however. Data were collected from numerous tasks conducted in Polish at several time intervals: language recognition, sentence repetitions, translation, written word order, and written grammaticality judgments. Analyses reveal that, although both learners, over time, managed to process many of the Polish words, utterances and structures presented to them in the input, they proceeded differently (i.e. their working hypotheses often differed) and they proceeded at different rates. This result has implications for both SLA theorizing and foreign language teaching.

Although Rast (1998) raised some questions about individual variability, it was this comparative study of Gilles and Luc that ultimately triggered curiosity about

the effects of individual variability when investigating groups of learners.³⁸ In the final pilot study for the VILLA project (the same learners as Rast et al., 2014 and Shoemaker & Rast, 2013), Hilton (2011b) conducted an exploratory study of individual differences in French native speakers learning Polish ($n = 18$). In this study, Hilton offers a preliminary analysis of the group's profiles with respect to a learner's capacity to inhibit and categorize information, and to his/her working memory span and personality. Correlation analyses with performance on Polish tasks were conducted as well. This work prepared the terrain for a more in-depth analysis of the same dataset as discussed in Rast et al. (2014). Taken as a group, little variability was found between learners and overall high performance was observed on tests measuring the phonological component of working memory, executive function of inhibition and the capacity for metalinguistic analysis. Responses on the motivation questionnaire also indicated high motivation. Although some variability in learning style and profiles was found, the group as a whole showed a tendency to adapt their preferences to specific learning situations. Other possible interactions between learning style and performance on Polish tasks were also found. For example, learners with a higher visual score on the learning style questionnaire showed some difficulty with the aurally presented grammaticality judgment test. Some individual analyses were also conducted in an attempt to explain why a given participant performed particularly high or low on a specific Polish task. Hilton (2011b) and Rast et al. (2014) highlight the importance of continuing to analyze the complex interactions between the numerous variables involved in accomplishing a task in a novel TL, and suggest an approach to analyzing individual variability in foreign language acquisition involving new techniques such as those being developed within the dynamic systems paradigm (de Bot, Lowie & Vespoor 2007; Larsen-Freeman & Cameron 2008).

2.5 Research questions: a response

We return here to the questions raised in Chapter 1 and again at the beginning of this chapter.

1. What is the L2/L3 initial state and what is the role of the L1?
2. What is the nature of the linguistic input, and what role does it play in learner language development?
3. What does the input actually look like in empirical studies of L2/L3 acquisition?

1. *What is the L2/L3 initial state and what is the role of the L1?*

³⁸ Pursuing research in the domain of individual differences in SLA has proved to be challenging and time-consuming. Fortunately Heather Hilton joined the input project at the University of Paris 8 and took on the responsibility of collecting individual variability data for participants in several first exposure studies (Hilton 2011b; Rast, Watorek & Hilton 2010; Watorek, Rast & Hilton 2011; Rast et al. 2014). We sincerely thank her for this extraordinary contribution to our on-going first exposure research.

Based on new methods of data collection and analyses that compare learners' performance on tasks in the TL with the TL input to which they are exposed, first exposure studies have brought us closer to a proper description of the L2/L3 initial state of acquisition. An initial and important finding is that adult learners are much more capable of processing linguistic information at first exposure than was predicted. Findings demonstrate that at first exposure or with minimal exposure (within minutes), learners can extract words from the TL speech stream, discriminate between permissible words in the TL and non-words, and begin to crack the code of the new morpho-syntactic system.

Frequency of an item in the input appears to help learners do this under certain conditions, but the research is inconclusive as to how much exposure is needed for frequency effects to be observed. What seems clear is that an account of early L2/L3 acquisition based on statistical frequencies is insufficient to account for the performance on many of the tasks observed in the first exposure data discussed in this chapter. Clearly learner's background languages play an important role; transparency effects are particularly robust in tasks that require form-meaning mappings. What also seems clear is that much learning happens immediately at first exposure and within the minutes and hours that follow. Research in SLA has, overall, not been able to observe or describe this initial activity because of the obvious constraints involved in collecting data at the initial stages of acquisition. First exposure studies are beginning to break through this constraint and make it possible to capture this initial activity. The more first exposure cross-linguistic data available for analysis, the closer we will get to a reasonable description of the L2/L3 initial state and the role of the learner's L1 in the first minutes and hours of exposure to the novel language.

2. What is the nature of the linguistic input, and what role does it play in learner language development?

Two input properties have been the focus of many first exposure studies discussed in this chapter: transparency and frequency.

The research from first exposure studies, regardless of theoretical framework, has identified robust transparency effects. In particular, these effects have been found on a learner's ability to extract words from the novel TL speech stream, recognize words, and repeat words in the TL. Although transparent words usually show a higher success rate in a variety of tasks than opaque words, this is not always the case. Rast et al. (2014) found that transparency appears to have a facilitating effect on learners' ability to judge the accuracy of inflectional morphology after minimal exposure. In early productions, however, results are less clear. The productions of some learners suggest that transparency may in fact interfere with accuracy; learners "know" the transparent word (lexeme) and they produce it easily without much initial processing. Opaque words, on the other hand, require a different kind of processing when encountered in the input.

For comprehension to occur, the learner may need to relate the word to a specific context for example. It may be that this additional step involves some level of processing of form (inflectional morphology in this case) in addition to meaning, a step that is potentially not required when processing a transparent word in the input.

VanPatten (2014) comments on the results of the grammaticality judgment test reported in Rast et al. (2014) that learners were more likely to judge the inflectional morphology in sentences correctly if the target words in these sentences were frequent and transparent. He identifies two possible interpretations of these results in terms of rule learning. On one hand, these findings may be viewed as support for productive morphological rules where inflectional endings need something to which they can attach themselves (in this case a lexeme). On the other hand, these findings suggest no productive morphological rules; endings are merely connected to words in a learner's lexicon, which, not surprisingly, happen to be the transparent and frequent words.

The precise role of frequency in language acquisition remains controversial. Some research has identified little to no role of frequency in certain tasks in the TL, some has found an important role but not initially, and some has observed robust frequency effects. This discrepancy is in part due to the different ways that studies measure frequency (over time or with respect to type or token frequencies).

Research reported in Chapter 3 attempts to resolve some of these issues with refined methodologies.

3. What does the input actually look like in empirical studies of L2/L3 acquisition?

Most importantly, first exposure studies take on the challenge of describing the input to which L2/L3 learners are exposed in detail. Currently input is measured quantitatively as described above, via the variables of frequency (or number of exposures) and transparency, as well as over time (e.g. the number of minutes or hours of exposure). Once the input is transcribed, lexical frequency counts can be easily extracted from the dataset. When the input is coded properly, both type and token frequencies can be calculated. The input can also be described qualitatively as an object of interaction: learners engaging with native speakers, with peers, or even with a computer program. In this type of description, exchanges between learners and their interlocutors are documented and analyzed with respect to how learners interact with the TL input. Descriptions of the input will be discussed further in Chapters 3 and 4.

2.6 Conclusion

What have we learned from first exposure studies so far? Findings reported in this chapter suggest that different linguistic processes need to be studied

separately, at least at first, in order to identify which factors play a facilitating role in which processes. To be clear on this point, the effects of specific variables vary across TL tasks. This result is not surprising given that different tasks require different language processes; however, the point to highlight here is the prudence required when making generalizations about the effects of factors on language acquisition. It is clear from research reported in this chapter that precise information about the language task and the proficiency level of the learners (linked to input exposure) must be included when reporting effects of variables, whatever they may be, on language acquisition processes.

What do we wish to learn from future first exposure studies? Following on suggestions articulated in the previous paragraph, we seek to obtain more precise information about the role of different factors in specific processes, such as perception versus comprehension, or comprehension versus production. For instance, many first exposure studies have shown that learners are sensitive to morphology at first exposure (e.g. Rast 2006a) and to formal structures (e.g. Park 2011), an important finding considering the dominant assumption in the SLA literature that learners rarely pay attention to, notice, process or use inflectional morphology. These results do not necessarily observe learners using these forms appropriately relative to the TL in question; however, they do provide evidence that learners are working on forms. It follows then that we would wish to know more about how they are working on these forms. In order to do this, we need cross-linguistic studies that allow us to tease apart L1 effects from other effects. We also need data over a longer period of time, especially for the research questions related to learner production and discourse.

As seen above, first exposure studies have contributed important empirical data, analyses and interpretations to research on the early stages of foreign language acquisition and have shown that measuring natural language input is possible in spite of what might appear to be insurmountable challenges. However, these studies remain few in number, they often operationalize variables differently, and they involve a variety of source-target language combinations investigating a wide array of linguistic phenomena that do not necessarily overlap with other relevant studies. Replications of the studies are few if non-existent, making it difficult to generalize the findings. As useful as these studies are, they have only scratched the surface in terms of our knowledge about the psycholinguistic and cognitive processes involved in language appropriation. For this reason, a group of European researchers combined forces and developed a cross-linguistic project that would allow for not only controlled classroom input but also controlled variables across five L1s on the acquisition of a shared TL. The project, *Varieties of Initial Learners in Language Acquisition: Controlled classroom input and elementary forms of linguistic organisation* (VILLA), which sets out to inform us about these processes and how they develop over time, is introduced in the following chapter.

Chapter 3

The VILLA Project: A First Exposure Study

Building on research reported in Chapters 1 and 2, in particular research conducted within the learner varieties framework, several teams of researchers came together to work on furthering our understanding of the initial stages of foreign language acquisition. This chapter describes selected methodological aspects and results of an extensive European input project entitled *Varieties of Initial Language Learners in Acquisition: Controlled classroom input and elementary forms of linguistic organisation* (VILLA), in particular those in which I have been most involved. The project brought together researchers working on the structure of learner varieties, namely the Basic Variety (BV) and pre-BV, as well as researchers working on input processing at the initial stages from a learner varieties perspective. This chapter begins with the research questions and methodology of the project, and is followed by a discussion of results, limitations and indications for future research, including research aimed at contributing more directly to the field of foreign language teaching.

3.1 Introduction

In July 2011, the VILLA project took on the challenge of controlling the target language (TL) input (Polish) in a cross-linguistic study of foreign language acquisition (see Dimroth et al. 2013 for detailed information about the methodology of the study).³⁹ The project differs from prior input projects (Rast 1998, 2003, as well as pilot studies conducted with Marzena Watorek from 2009-2011) in that it includes learners of several native languages (not only French), allowing for cross-linguistic comparisons, and as such, a broader scope. Funded by an Open Research Area for the Social Sciences in Europe (ORA) grant across three countries (France ANR, Germany DFG, and the Netherlands NWO), the project was originally conceived and implemented by three research teams coordinated by Marzena Watorek and Rebekah Rast in France (CNRS-UMR 7023, University of Paris 8, The American University of Paris),⁴⁰ Christine Dimroth in Germany (Universities of Osnabrück and Münster) and Marianne Starren in the Netherlands (Radboud University, Nijmegen). Three additional teams joined the project soon after its conception, coordinated by Leah Roberts, Emma Marsden and Henriette Hendriks in England (York and Cambridge) and Giuliano Bernini

³⁹ I take this opportunity to thank Coralie Vincent for her dedication to the project, her expertise in data collection, including procuring relevant computer software, setting it up and training the team to use it, and as her extraordinary patience and calm demeanor in times of crisis.

⁴⁰ Other members of the original French team include Heather Hilton, Monika Krzempek, Paulina Kurzepa, Monique Lambert, Agnieszka Latos, Ewa Lenart, Tiphaine Medam, Urszula Paprocka, Sebastien Piotrowski, Jasmine Scheuermann, Ellenor Shoemaker, Pascale Trévisiol, Daniel Véronique and Yolande Zancan.

and Marina Chini in Italy (Bergamo and Pavia).⁴¹ The importance and originality of the project lies in not only its cross-linguistic nature (the acquisition of Polish by native speakers of Dutch, English, French, German, and Italian), but also in its complete control and documentation of the TL input from the moment of first exposure through the first 14 hours of exposure. This documentation, the VILLA database, controls both L1 knowledge and TL input in order to observe the performance of learners with various L1 backgrounds acquiring the same TL under comparable conditions. In this way, we can tease apart L1 and TL input effects, while also identifying effects unrelated to the L1 and TL input. With this control, the project is able to address questions that have been difficult, if not impossible, to answer without this type of control, such as whether learners, when faced with a task in the TL, rely on general cognitive abilities that are independent of the linguistic knowledge of their L1 and/or of the TL to which they are exposed, or rather, whether they rely on universal linguistic principles. This controversial issue is one of the greatest challenges for researchers in SLA.

It is important to highlight here that, as with many other studies in the field of SLA, the TL being learned is not necessarily the L2 of the learners, but may be an L3, L4 or L5. In the case of VILLA, the TL (Polish) carries L3 status⁴² for all the adult learners of the project. In other words, the adult learners came to the study with linguistic knowledge of not only their L1 but also at least one L2 if not more. Background languages were controlled in all countries as explained in Section 3.3 (the languages of the VILLA project).

The VILLA project was developed within the learner varieties (LV) approach to language acquisition. The researchers who designed, implemented and conducted studies for the project have a long history of working within this framework and have produced a phenomenal collection of work on language acquisition, especially with respect to information structure in learner discourse (see Watorek, Benazzo & Hickmann 2012a - a collection of work published as a tribute to Clive Perdue, and Perdue 1993; also see Dimroth & Lambert 2008; Dimroth & Starren 2003; Hendriks 2005; Klein & Dimroth 2005; Perdue 2000; Watorek 2004b). With respect to SLA research, the project on which this approach is based, the European Science Foundation (ESF) project (Perdue 1993), set out to understand the processes of SLA by means of an empirical cross-linguistic study of the productions of beginner learners in their TL. In developing such a study, Perdue and colleagues were able to identify a set of

⁴¹ A PRIN 2009 grant, financed by the Ministero dell'Instruzione dell'Università e della Ricerca - MIUR, entitled "Lingua seconda/lingua straniera nell'Europa multilingue: acquisizione, interazione, Insegnamento" was offered to Guiliani Bernini, University of Bergamo, making it possible for two Italian teams (University of Bergamo and University of Pavia) to join as partners in the VILLA project, and Leah Roberts received a British Academy grant for the University of York.

⁴² The term "L3" is often used for the TL language when it is the third or additional language known by the learner (Cenoz, Hufeisen & Jessner 2001).

universal principles that appear to drive the adult second language acquisition process. At the same time, their work also raised questions about the nature of even earlier stages than those attested by the ESF learners and the knowledge that learners bring to the acquisition process (Perdue 1996a). It became clear that studies examining learners who were not yet as advanced as the ESF learners were necessary in order to control for the influence of both L1 knowledge and TL properties. As mentioned in Chapter 2, several studies have begun to fill this gap (e.g. Dimroth et al. 2006; Gullberg et al. 2010; Rast 2008); however, these studies have not collected data from learners of different L1s exposed to the same TL input. With this lack of comparable data, they cannot compare source language effects. The VILLA project, in essence, is a natural follow-up and complement to the ESF study in that it confronts the proposed principles of the Basic Variety (and pre-BV) with data collected from absolute beginners, while also contributing analyses on not only production, but also receptive data.

3.2 Research questions and predictions

Research questions have evolved as the project has progressed. Eight general questions are currently driving the project's analyses. For each question, an explanation and, in some cases, general predictions are proposed based on prior research on the early stages of foreign language acquisition. More specific hypotheses are treated later in the chapter within sections organized by linguistic domain, which describe learner performance on particular tasks in TL Polish. Questions 1-4 concern all project teams and all tasks. Questions 5 and 6 are group dependent; that is, they apply to certain groups of learners, but not others. Questions 7 and 8 involve a closer look at the traits and linguistic backgrounds of individual learners.

Questions across all project teams and participant groups

RQ1. *The L2/L3 initial state* - What is a learner capable of perceiving, comprehending, and producing in a novel TL at first exposure? What processes are active even *before* learners are able to express themselves in the TL by means of non-formulaic constructions?

Based on prior first exposure studies reported in Chapter 2, which show that learners are quite capable of processing and even producing (in the form of repetition) some language at first exposure (e.g. Carroll 2012b; Carroll & Widjaja 2013; Ellis & Sagarra 2010; Gullberg et al. 2010; Gullberg, Roberts & Dimroth 2012; Han & Liu 2013; Han & Peverly 2007; Park 2011; Rast 2006a, 2008; Shoemaker & Rast 2013), we expect learners to rely on their prior linguistic knowledge (L1 and other L2s) to accomplish tasks in the TL at first exposure. We also expect to observe processes that are independent of prior linguistic knowledge, such as using prosodic cues to identify word boundaries (Shoemaker

& Rast 2013) or showing sensitivity to morphological marking at first exposure even when their other known languages attest little inflection (Rast 2006a).

RQ2. *Overall exposure to Polish input* – To what extent do learners' abilities develop over time (at various time intervals from first exposure to 14 hours of exposure)?

Based on prior studies which show rapid development at the initial stages of acquisition (e.g. Carroll 2012; Carroll & Widjaja 2013; Gullberg et al. 2010; Gullberg, Roberts & Dimroth 2012; Rast 2008; Rast, Watorek & Hilton 2010; Watorek, Rast & Hilton 2011; Shoemaker & Rast 2013, 2014), we predict that learners will improve in their ability to perceive, comprehend and produce in the novel TL at the different test times, but this improvement will be constrained by factors that are under investigation in the VILLA project and elsewhere. These factors include, but are by no means limited to, L1 influence, properties of the input, such as transparency and frequency, and individual differences.

RQ3. *L1 effect* - What is the role of the source language in these processes of perceiving, comprehending and producing at first exposure and within the first 14 hours?

As discussed in Chapter 1, theories diverge quite drastically with respect to this question of L1 influence, and few studies have managed to control the input in such a way that permits an empirical study of L1 effects. As per our prediction for RQ1, learners in the VILLA project will likely make use of their L1 at first exposure, but we are uncertain what the effect will look like or how long it will last. The VILLA project seeks to observe what learners of different L1s do with the same TL input. In what domains will we observe differences in performance and development between different L1 groups? In what domains will we find performance and development to be independent of L1 knowledge?

RQ4. *Role of the TL input* - What is the role of the linguistic input in these processes of perceiving, comprehending and producing at first exposure and within the first 14 hours? (e.g. frequency and lexical transparency of items and features in the input)?

As mentioned in Chapter 2 (Section 2.2.3), prior studies have shown a powerful role for transparency in word learning at first exposure (e.g. Carroll 2012b; Rast 2008), and even for learning morphological rules (e.g. Rast et al. 2014). Rast and colleagues also found this effect to be task specific, however. One objective of the VILLA project is to provide insights into the nature of transparency with respect to comprehending and producing not only new words, but also new morpho-syntactic structures. For frequency, results of some prior L2 first exposure studies have shown a powerful role for frequency (e.g. Gullberg et al. 2010; Gullberg, Roberts & Dimroth 2012), although this role is not always immediate (e.g. Rast 2008; Shoemaker & Rast 2013). Other studies have not found a frequency effect (e.g. Carroll 2012b). As with transparency, the effect of

frequency may be task dependent and is therefore carefully observed across tasks in the VILLA studies. Interactions between transparency and frequency may also be found. Transparency and frequency are by no means the only aspects of the input worth investigating, as discussed in Chapter 1 in FLA studies; however, these are the two features in the input that were consistently controlled in the TL input of the VILLA project. For this reason, the discussion of results will focus on these two input features.

Questions related to selected project teams and participant groups

RQ5. *Effect of different input conditions* - What are the effects of different types of presentation of similar TL properties, i.e. input that is more or less focused on structural properties of the language?

An additional variable explored by the project and one that has been only minimally addressed within the learner varieties approach (see Watorek, Rast & Hilton 2011 and Winkler 2011 for exceptions) is the effect of highlighting structural properties of the input on learners' performance. Extensive research from other perspectives has been conducted in this domain (Doughty 2003 for an overview; Sharwood Smith 2014); however, little research has examined this variable systematically and at the early stages. Based on the findings of prior research that show some benefits of focus on form (Norris & Ortega 2000; Spada & Tomita 2010), the VILLA project predicts that some focus on structural properties of the input will favor certain aspects of acquisition, but not all. Most importantly, based on findings of the ESF Project (Perdue 1993), the LV approach assumes an important role for the input, not only in terms of quantity, but also in terms of quality (see also Piske & Young-Scholten 2009). Studying the effect of more or less focus on the structural properties of the TL will contribute to the increasingly documented debate on pedagogical efficiency. This issue is further explored in Chapter 4, and a more detailed description of the two input conditions in the VILLA project is provided below in the section on methodology (see Section 3.4.3).

RQ6. *Age effect* - How do children and adults compare with respect to extracting information from the input and using it?

Another question raised recently in first exposure studies concerns the nature of the L2 initial state in children. This part of the project investigates the assumption that children generally outperform adults in foreign language acquisition. The Critical Period Hypothesis, which predicts age-related differences in learners' ultimate attainment in language acquisition, has driven the research in this domain. The assumption from this work is that children learn better and possibly even faster than adults, effectively expressed by the popular metaphor "children are like sponges". A growing research agenda on this question has resulted in contradictory results and has fed the debate about how to explain age differences in L2 acquisition (Dimroth 2008, 2009; Muñoz &

Singleton 2011; Unsworth 2008, 2016). Although the age factor is a focus for the VILLA project, data were only collected from one group of children in Germany. Results concerning this question of “age effect” will not be treated in depth in this volume.

Questions regarding additional language knowledge and learner variability

RQ7. *Effect of other L2s* – What is the role of the learners’ other known languages in the processes of perceiving, comprehending and producing at first exposure and within the first 14 hours?

In the case of adult participants (with the exception of some of the native speakers of English), Polish was not strictly speaking an L2, but rather an L3 (i.e. the third, fourth or fifth language being learned). As described in Chapter 2, findings from the little research conducted on the initial stages of L3 acquisition have led to constructive debates about the relative importance of the L3 as it relates to the L1, other L2s and UG. Without a doubt, prior knowledge of languages other than the L1 has an impact on the processing and acquisition of additional languages (De Angelis 2005, 2007; Rast 2006a, 2008, 2010c). However, the type of impact is still in question (Bardel & Falk 2007; Håkansson, Pienemann & Sayheli 2002). Although the VILLA project collected background language information for all learners, it was not able to establish identical groups with respect to this factor. For this reason, the effect of background languages on a learner’s acquisition of the new TL will be discussed in conjunction with individual or small group analyses. The VILLA project will also investigate the suggestion that prior experience with multiple languages may affect the way an individual learns a new language (Cenoz 1997).

RQ8. *Individual differences* - What is the role of individual variability in the acquisition processes of absolute beginners?

The role of individual differences in language acquisition is a growing area in the field of SLA (e.g. Dewaele 2009; Dörnyei 2005; Roberts & Meyer 2012; Robinson 2002). While the VILLA project ran several tests to rule out potential differences between learners, the principal objective of this dataset is to observe the variables that may come into play in instructed language acquisition, such as attentional capacity, working memory capacity, personality, metalinguistic awareness, motivation for learning Polish, and learning style. The project will explore between-group differences, as well as correlations between scores on the measures of individual difference and results on the Polish tasks. Included in these analyses are the outlier data, which will contribute to our understanding of the language development of learners with particularly high or low performance on measures of TL knowledge and performance. Analyses of these data are on going and as yet inconclusive; discussion in the results section is therefore minimal.

3.3 The languages of VILLA (L1s, L2s and TL Polish)

The cross-linguistic nature of the VILLA project requires some understanding of both source and TL properties (e.g. phonological, morpho-syntactic and semantic). While the details about cross-linguistic differences are provided in Dimroth et al. (2013), selected linguistic analyses and comparisons appear in this chapter along with descriptions of tasks and results within specific linguistic domains (see Section 3.5). This section describes very briefly those properties that are pertinent to the data analyses conducted so far, that is, a linguistic description of the phenomena in the TL that can account for the differences in the effect of the input across L1s. In considering the role of the input and based on findings reported in Chapter 2, we assume that some linguistic domains may be influenced by the input and/or the L1 more than others. In addition, some may be more or less sensitive to a particular type of input presentation.

The TL of the study, Polish, differs from the L1s of the study in numerous ways. In the area of phonology, research has shown robust L1 effects on L2 processing (Shoemaker & Rast 2013), suggesting that phonological differences between a given L1 and Polish may influence how learners perceive and process information in the input. For instance, Polish has a richer inventory of fricatives and affricates than other languages of the study. How will learners acquire these new contrasts, process them and begin to use them?

With respect to structural properties, the Polish language attests rich morphology, flexible word order, pro-drop, no obligatory determiner, and a temporal-aspectual system in which aspectual marking is independent of verbal tense marking. The presence or absence of subject pronouns and determiners depends on pragmatic relations. This dependence is true as well for word order, which is tightly linked to a rich and complex nominal morphology. Noun phrase constituents are marked for three possible genders, two numbers and seven cases. Together gender, number and case determine the word endings of nouns, adjectives and numerals. Person and animacy are attested as well within the category of masculine gender.

No source language of the study has this particular linguistic configuration. Italian is the closest in terms of richness of verbal morphology and the absence of subject pronouns. Although word order in Italian is also dependent on pragmatic relations and its system of verbal morphology is rich, case is only marked on pronouns in Italian. German and Dutch are both V2 languages, meaning that the verb is placed in utterance-final position in subordination, allowing for constituent word order other than SVO; however, neither is a pro-drop language, and the V2 rule in Dutch is more rigid than it is in German. German marks its three genders, two numbers and four cases on determiners, pronouns and some nouns, bringing it the closest to matching the Polish nominal inflectional system. While French, Italian, Dutch and English do not mark case on

lexical NPs, some case marking can be found in the pronominal systems of all the source languages.

In terms of the acquisition of a new morpho-syntactic system, of particular interest to the VILLA project is the effect of the L1 and other factors, such as transparency and frequency, on the processing and acquisition of Polish word order and inflectional morphology.

3.4 The VILLA database: Methodology

This section complements the description of the VILLA project's methodology as described in Dimroth et al. (2013) and provides additional details with respect to prior first exposure studies and to certain methodological decisions. The results section provides an overview of selected analyses of the VILLA data, namely those to which I have contributed. Analyses are in progress and will continue for quite some time given the size of the VILLA database. The database includes audio (individual tracks) and video recordings of 14 hours of Polish instruction for two groups of 15-20 students in each country, as well as 26 Polish tests and additional tests of individual measures for each participant. In total, the database comprises approximately 70 hours of Polish instructor input, 1,260 hours of in-class learner oral production data, 2,340 Polish test results available for analysis, and 810 individual differences tests. This database is being used by project members and their students, and is gradually being made available to the scientific community in digital repositories.⁴³

3.4.1 VILLA Participants (Learners and control groups)

This section briefly describes the participants of the study. Although the learners of Polish in all project countries were the principal participant groups, control group participants have also been essential to the success of the project. We begin here by describing the control groups, followed by the learners of Polish.

3.4.1.1 Control group participants

3.4.1.1.1 Source language controls for transparency

In Rast's (2006a, 2008) study of French beginning learners of Polish, "transparency", defined as the psychotypological similarity between a word in the learner's L1 and the TL, was found to be a powerful variable in learners' early perceptions and productions. To further investigate this finding, the VILLA

⁴³ The grammaticality judgment test (Hinz et al. 2013) is available on IRIS at the following URL: <http://www.iris-database.org/iris/app/home/detail?id=york%3a822997&ref=search>
Data from all countries are currently being organized, homogenized and uploaded to Ortolang: http://sldr.org/voir_depot.php?lang=fr&id=915). We thank Sarra El Ayari for her precious assistance with this monumental digitalization project.

project set out to observe the effect of transparency across all learner groups. Building on methodology established during the various studies conducted at the University of Paris 8, all project countries recruited control group participants, native speakers of all source languages of the study with similar profiles to VILLA project learners, to collect data that would be used to establish the criteria for “lexical transparency”. A “transparency” test was administered to establish a list of Polish words that could be comprehended by native speakers of all languages of the study. Participants were asked to listen to the words recorded by a native speaker of Polish and translate them as best they could. Categories of transparency were established based on the results of this test, allowing for a complete control of the factor “transparency” across all Polish experiments designed for the project. The criteria for transparency were based on the system established in Rast and Dommergues (2003); however, a major modification was made. To avoid the range of 25%-75%, which signifies that some participants translated the word correctly whereas others did not, emphasis was placed on identifying words that were either transparent to no one (“opaque”) or “transparent” to at least 75% of the control group participants. Hence, only two of the three levels of transparency were maintained in the VILLA project: words categorized as “opaque” (rating of 0% correct translations), and words categorized as “transparent” (rating of 51-100%).⁴⁴ Establishing a “fairly transparent” (1-50%) group as per Rast (2003, 2008) was considered unnecessary because this category would comprise words that were in fact not transparent for at least, if not more than, 50% of the participants. Indeed, in the sentence repetitions described in Rast and Dommergues (2003), learners repeated “fairly” transparent words at a success rate in between the opaque and “very” transparent word rates at first exposure to Polish, and they repeated these words better over time to the point where the success rate for “fairly” transparent matched the rate for “very” transparent words after 8 hours of exposure.

3.4.1.1.2 Background language control groups on Polish tasks

On-going data collection from native speaker control groups continues as needs are identified.⁴⁵ As with the transparency test mentioned above, control group participant profiles resemble those of VILLA project learners. In the case of Polish tests that were administered at different time intervals, especially those testing receptive capacities, a methodological issue raised by reviewers of the

⁴⁴ In reality, the vast majority of “transparent” words were translated by 75-100% of the control group participants. Because a few words were translated by only 50%, we used this as our threshold.

⁴⁵ Data have been collected from native speakers of French at the Université de Poitiers and Sorbonne Nouvelle, and from native speakers of English at the American University of Paris and the University of York. We thank Erica Medina for her assistance with control group data collection.

project proposal was test effect. To check for an effect, control participants are administered the same Polish tests as the learners at similar time intervals as the learners, but the controls have no exposure to Polish between test times. If no improvement is found over time, we can assume a lack of test effect for the test in question.

Control group data were also collected for the purpose of comparisons between how one structures discourse in the L1 versus the TL. Data are gradually being collected from native speakers with similar profiles to our learners performing a specific language task in their L1.

Another comparison is found in L3 research and seeks to understand the role of other L2s in the learning of an L3. Native speakers of other background languages of the VILLA learners have taken the Polish tasks with a view to establishing points of comparison between structures in learners' L2s and structures that appear in their productions in Polish (for more information, see Rast et al. 2015; Watorek et al. 2016).

3.4.1.1.3 Polish native speaker controls

Again, for the purpose of comparison, fifteen native speakers of Polish were also recruited for the project to control for native performance on a variety of Polish tests, in particular the receptive tests and tests that require processing of morpho-syntactic information. Results of the Polish controls are reported with learner test results in Section 3.5.⁴⁶

3.4.1.2 Learners

3.4.1.2.1 Learner profiles

In all project countries, with the exception of Germany, two distinct groups of adult learners with similar profiles (age, linguistic background and disciplines studied) took the same Polish course with the same instructor. In Germany, one adult group with the same profile as adult participants in other countries took the Polish course. In addition, a group of 10-year-old German children took a modified version of the course, but with the same instructor as the adults.⁴⁷ Those selected had no prior knowledge of Polish or any other Slavic language, and all were “monolingual” following Grosjean’s (1982) distinction between bilingual and monolingual, that is, all were users of only one language on a daily

⁴⁶ The Polish native speakers were 20-25 year-old students at the University of Lublin (Katolicki Uniwersytet Jan Pawel II). As with the learner groups, students specializing in linguistics, philology, or psychology were not accepted as participants. We thank Urszula Paprocka for organizing the data collection and Paulina Kurzepa for collecting the data.

⁴⁷ Some of the children had a migration background and came to the course with some elementary knowledge of Russian. They continued to take part in the course, but their data were excluded from analyses.

basis, and none were raised with two languages. All adults were university students who had some additional foreign language knowledge (see the following section for details on other L2s) and were enrolled in disciplines other than linguistics, philology, or psychology. In all, the groups comprised 14-20 learners. Taken together, 176 learners took part in the entire two-week Polish course and as such received largely the same TL input.

3.4.1.2.2 Individual variability

With respect to individual differences between our learners or smaller groups of learners, we take into consideration the other background languages of our learners, as well as a large battery of measures intended to collect information about our learners regarding a variety of aspects as discussed below.

Other background languages of the learners (L3 acquisition)

As mentioned above, learners had knowledge of languages other than their L1. Ideally the project would have established tighter constraints on background languages; however, the more constraints one has, the harder it is to find a sufficient number of participants for the study. For this reason, each country set its own policy about other L2s in the participant selection process so that information about background languages was controlled within any particular L1 group. As a result, L2s vary and therefore data will require special analyses when addressing the issue of L3 acquisition. Given that we did not conduct proficiency tests in participants' other L2s, an important element of the learner profile data collected is their self-assessment of their language proficiency in other L2s. Self-assessment was measured on a scale of 1-5, with 1 being minimal proficiency and 5 being fluent.

In France, all learners had knowledge of English and another Romance language. No participant had studied a Germanic language, and some learners had studied one or two years of Latin in junior high school.

In the Netherlands, all learners had knowledge of English, and all learners had studied either German or a Romance language.

Although the majority of Italian learners had English as their first L2, several had French or Spanish. Those who had French or Spanish as their first L2 had English as their second L2, with the exception of one. Many had studied Latin, and four had studied German as a third L2. Finally, one learner had studied Hungarian for one year, (self-assessment 1 out of 5) and another had studied Chinese for two months (self-assessment 1 out of 5).

In Germany, the adults all had English as their first L2, and all had studied at least one other foreign language, generally Romance (Spanish, French and/or Latin) except for one, who took Dutch as a second L2. Two others studied Dutch

as a third or fourth L2, and one studied Swedish. One learner knew some Turkish (self-assessment of 2 out of 5). All of the German children had L2 English exposure at school and a few also had French in addition to English (also see footnote 7).

The UK participants offered a different scenario. For 10 of the 35 learners in the UK, the Polish instruction of the VILLA project was their first experience studying a foreign language. Other learners had studied French, German or Spanish, and only one had studied a bit of Latin. Given this scenario, these data will be particularly valuable for comparative studies of L2 and L3 acquisition.

Clearly, data collected from some of the learners mentioned above will provide interesting information for case studies in L3 acquisition, namely whether one year studying Hungarian seemed to affect the Italian learner's acquisition of Polish nominal inflection, or whether the German learner's low-intermediate level of Turkish had any unusual effect on the learning of Polish. Findings of these studies will contribute nicely to hypotheses proposed in Rast (2010c) regarding language acquisition beyond the L2, such as the facilitating effect of a typologically similar L2 on a new L3. Also of interest will be whether or not we see significant differences in the UK participant performance relative to other LI groups that might be linked to the fact that many of the UK learners had never studied a foreign language before joining the VILLA project.

Measures of individual variability

In an attempt to control as much information as possible about the learners of the project, information was collected on individual variability by means of a battery of non-linguistic psychometric tests.⁴⁸ The data are currently being analysed quantitatively for group comparisons and generalizations, and qualitatively for individual learners, namely in cases where learners or a small group of learners show a particularly strong or weak performance on a Polish task. All learners of the study completed the following tests and questionnaires during the two-week data collection period:⁴⁹

- Raven's Standard Progressive Matrices (Nonverbal intelligence)
- NEO FFI (Personality - Big Five)
- Digit span task (Memory span)
- Sequencing Task (Working memory span)
- Flanker task (Executive function - attention and inhibition)
- Barsch Learning Styles Inventory (Cognitive style - perceptual preference)
- ISALEM-97 (Learning style)

⁴⁸ The German children were administered modified versions of these tests, as well as the "Wortschatzuntersuchung 4-6, Deutsches Institut für Internationale Pädagogische Forschung" to test L1 vocabulary size.

⁴⁹ Heather Hilton coordinated the collection of these data. Analyses are in progress (e.g. Hilton, Rast & Starren 2015).

- adapted from Gardner (2004) Attitude & motivation test battery (motivation)
- llama F test (Meta-linguistic awareness - grammatical inferencing)
- llama B test (Meta-cognitive - associative learning)
- llama D test (Phonological memory/ awareness)

3.4.2 The linguistic input (Polish in a classroom setting)

The Polish instructor was recruited through a competitive process in Poland. Four candidates were retained for interviews, which included the observation of candidates simulating a 10-minute Polish lesson during which they were teaching students who had no knowledge of the language.⁵⁰ For the position, the project members sought a native speaker of Polish who had minimal language teaching experience so as not to be overly influenced by specific methods of language teaching. The successful candidate would be trained to teach Polish according to the methodology of the VILLA project. The successful candidate would also need to be available for a period of one year and be able move to all project countries for a stay of two to four weeks at a time.⁵¹

Polish instruction for all groups took place over 10 days (Monday to Friday for two weeks). Each session lasted 90 minutes each (with a 15-minute break halfway through), except for the last day when learners received 30 minutes of input before extensive testing. All learner groups received a total of 14 hours of Polish instruction (the “input” of the study). A native speaker of Polish was recruited to teach all Polish classes across countries in order to avoid the additional variable of teacher and teacher style. The instructor was trained in France in January 2012, and she taught for four weeks in each project country through September 2012.

Before training the instructor and before the Polish instruction began, a number of important decisions had to be made about the Polish classrooms across countries. For the most part, the project followed the methodology used in prior instructed input studies on the acquisition of TL Polish (Rast 2008; Watorek, Rast & Hilton 2011; Rast et al. 2014). However, given the larger scale of the VILLA project, all decisions needed to be carefully discussed by all teams.

The following section highlights some of the decisions made about the Polish course and the input and provides justification for these decisions.

1. *L1 and meta-language in the classroom*

⁵⁰ We thank Urszula Paprocka for coordinating this process at the University of Lublin (Katolicki Uniwersytet Jan Pawel II). Marzena Watorek, Urszula Paprocka and Rebekah Rast conducted the interviews in Lublin.

⁵¹ The successful candidate was Monika Krzempek, and to this day, five years later, we are forever grateful for the remarkable energy, expertise, patience and determination that Monika brought to her role of Polish instructor for the VILLA project. She, without a doubt, secured the success of the project.

The first crucial matter was the question of the language(s) to be used in the classroom, i.e. whether to use Polish exclusively, some English or some English mixed with other native languages depending on the country of instruction. It was decided that the Polish instructor would follow the methodology established in a VILLA pilot study conducted at the University of Paris 8 (Watorek, Rast & Hilton 2011; Rast et al. 2014) and use only Polish in the classroom. This decision was made for several reasons. First, to allow for balanced L1 use if this approach were selected, the project would have had to recruit an instructor who spoke all languages of the project, and this was not possible. Secondly, the use of L1 introduces yet another variable, whereas the objective of VILLA was to reduce the number of variables as much as possible. Finally, language teachers often resort to the L1 for metalinguistic explanations, an approach that would not be used in the VILLA classroom. This being said, learners did occasionally use their L1 with each other. Given that all interactions in the classroom were captured through the learners' individual microphones, the use of L1 and its potential effects on performance can be investigated.⁵²

The use of meta-language in the classroom also needed serious consideration. Although the decision was made to have the instructor use no meta-language as per the VILLA pilot study mentioned above, only a close look at the instructor's input can confirm whether or not she actually made use of meta-language.

The question of intention versus reality in the VILLA project is an important one. Once the participant data from the classroom have been transcribed, members of the project will be able to investigate what learners actually said to each other, whether in Polish or in another language. In the instructor data, a future project will be the analysis of the use of meta-language, for which criteria must be established. Similar procedures are being put into place for corrective feedback, as discussed below.

The benefits of using meta-language and the learners' L1 in the classroom remain highly debated areas in the field and will be discussed briefly in Chapter 4.

2. *General teaching approach*

A teaching approach also needed to be defined. It was decided to use a communication-based method with a focus on aural/oral skills to replicate a natural Polish language setting as closely as possible while also meeting the research needs of the project. Themes included typical topics used in communicative-style beginning language instruction, such as introductions, family, travel and directions. Short recordings of dialogues and short video clips were introduced to add variety to the classroom activities. All recordings were controlled for in terms of frequency and transparency and transcribed and coded

⁵² Note that the precise use of the L1 (how and when it is used) is a variable that has been largely researched (see Ellis & Shintani 2014 for an overview).

in such a way that they could be included in the overall input analysis if desired. The decision to consider dialogues and videos as part of the input of the study has been left to the discretion of the researcher conducting the analysis.

3. *Teacher talk*

The Polish instructor was encouraged to use some spontaneous speech in the classroom for ecological reasons. However, to keep the input as constant as possible, two sets of lesson plans guided by PowerPoint slides were prepared in collaboration with the Polish instructor following the requirements for the two input conditions (see Section 3.4.3). The instructor used these slides to guide her classes and maintain consistency across learner groups.

At times during the lessons, the instructor directed her speech to all learners. At other times, she used a typical question-answer dialogue format with individual students. Occasional interactive activities between learners were included to give learners the opportunity to put their knowledge to use in interaction. The general “input” of the study is the Polish addressed to all learners by the instructor. Transcriptions of the input have also been coded for “other input”, which refers to these interactive moments. This input can be analysed in its own right or combined with the general input of the study if desired.⁵³

4. *Teaching pronunciation*

The question of whether or not to teach explicit pronunciation of Polish sounds was an issue of debate. As mentioned in Section 3.3, Polish phonology differs quite drastically from the L1s of the study. For this reason and based on prior studies of *ab initio* learners of Polish, the possibility of offering some explicit training was discussed. In the end, however, it was decided that such explicit training strayed from the original objectives of the project and would add an additional teaching/learning goal, potentially complicating analyses of the data. The only aspects of Polish that were to receive explicit instruction⁵⁴ were morpho-syntactic structures, and this only in one of the input conditions. So as not to complicate matters, project members decided that learners would not be given explicit instruction in Polish phonology.

5. *Structures and lexical items to be taught and used in Polish tasks / input properties: transparency and frequency*

Polish words to be taught were selected carefully, keeping in mind pre-selected themes, the fact that the learners were at the absolute beginner level of Polish, and the project’s research questions. A carefully selected group of Polish words was held constant in order to test the effects of lexical transparency and

⁵³ A VILLA manual is currently being drafted and will contain detailed information about the project, such as the input coding schemes used in the transcriptions of VILLA production data.

⁵⁴ We use DeKeyser’s (1995) definition of “explicit instruction” as in Watorek, Rast & Hilton (2011). See also Chapter 4.

frequency across input conditions and L1 groups. These words were distributed across the Polish lessons in order to meet the pre-set criteria for frequency in the classroom input (see Section 3.4.4) and to ensure that the learners would be able to comprehend these lexical elements in receptive tasks and use them when confronted with production tasks in Polish.

A selection of morpho-syntactic properties of Polish also figured quite prominently in the classroom input, in particular selected features of nominal case and gender marking. These forms occurred very frequently to ensure that learners were sufficiently exposed to patterns in the input that could potentially be integrated into their developing learner grammars. These properties differed from other very frequent ones (e.g. subject-verb agreement) in that particular contrasts, for example between nominative and instrumental case with masculine and feminine nouns referring to professions or nationalities, occurred with high frequency during selected input sessions and were often the focus of question-answer sequences or interactive games. Other properties, such as subject-verb agreement, received a smaller degree of this pre-input planning; rather, they appeared spontaneously in the instructor's input and/or Powerpoint slides.

6. *Written form in the classroom*

Given that the project's focus was on spoken Polish (aural and oral abilities), the first day of the course (90 minutes) included no written Polish, and throughout the duration of the course, learners were told not to write or take notes. Written words were introduced into Powerpoint slides as of the second day to facilitate the learning of lexical items. The success of many VILLA experiments depended on the ability of learners to understand groups of pre-selected Polish words.⁵⁵

3.4.3 Input conditions: two types of input⁵⁶

In order to investigate RQ5 (see Section 3.2), the project observed the effects of two different approaches to teaching morpho-syntactic properties of Polish with the same content.

The two input conditions, meaning-based input (MB) and form-based input (FB), were applied in all project countries with the exception of Germany, where the effect of age rather than input type was the focus. Based on findings from ESF studies and Doughty's (1991) work showing the importance of input for adult language acquisition, we assume that input is crucial for successful TL learning. In instructed SLA, the beneficial effects of some structured input on learning have been demonstrated (Norris & Ortega 2000; Spada & Tomita 2010). For

⁵⁵ Based on Rast's (1998, 2003) studies, essentially pilot studies for VILLA, and other studies of instructed SLA, we recognize that adult learners educated within the European system often rely quite heavily on visual (written) input.

⁵⁶ The "Input Description Manual" was drafted by Agnieszka Latos.

these reasons, in both input conditions, the VILLA project used an approach to teaching based on decades of research into the efficiency and effectiveness of approaches to language teaching, that is, a communication-based instruction with structures organized and presented in such a way as to facilitate the learning process. An example taken from the VILLA instruction is the presentation of nominal morphology. For both MB and FB input groups, the feminine and masculine forms were introduced together (orally and visually) to provide learners with the opportunity to observe the contrast in forms.

The two input types, meaning-based input (MB) and form-based input (FB), differed in two ways: 1) how the instructor presented the material during the lessons, in both oral and written forms; 2) how the instructor corrected learners' grammatical errors.

With respect to how the instructor presented the material, the FB group received input that was treated with textual enhancement (Sharwood Smith 1993). This enhancement included highlighted grammatical components, such as word endings that signal gender and case on the noun (bold font and color were used for highlighting) and additional visuals, such as tables displaying inflectional paradigms. The MB group, on the other hand, received none of this. In the masculine-feminine morphology example given above, the MB input contained no highlighting, whereas the FB input contained highlighting of the noun endings as in the presentation of *tłumacz* ("translator" – masculine nominative) and *tłumaczka* ("translator" – feminine nominative).

With respect to corrective feedback (CF), this discussion proved to be complex and enlightening. The research on CF in Instructed SLA (ISLA) is not entirely conclusive despite the decades of research in this area (see a more detailed discussion in Chapter 4). VILLA project members who engaged in this discussion were concerned about several issues. Firstly, following the LV approach to analysing language data, members emphasized the importance of context and discourse when considering how the instructor would reply to learners' utterances during the lessons. Several members expressed doubts as to whether the instructor would be capable of providing one type of CF for a MB group over a period of two weeks and then switching to a different type of CF for a FB group. The challenge for CF in communication-based interaction is the spontaneity of it. Lessons can be planned in advance with textual enhancement and CF can be planned to a certain extent, but much CF occurs extemporaneously. The group decided that guidelines for the instructor would be established and following the data collection period, CF in the input would be investigated.⁵⁷ In the MB condition, the instructor was asked to maintain the focus on meaning, that is, clarification requests were encouraged, but explicit correction was to be avoided.

⁵⁷ This particular input study is in progress. In order to be able to describe the instructor's CF in a useful way, the classroom input, as well as the productions of learners in interaction with this input, must be transcribed and analyzed. This process is both lengthy and costly.

In the FB condition, the instructor was encouraged to use explicit correction. Metalinguistic comments were not to be used in either condition. Although a study of CF use in the VILLA instruction is in progress, we know from preliminary accounts of the input that while some explicit correction was used in the MB condition, explicit correction was used more extensively in the FB condition. The exact distinction will be documented with continued research on this question.⁵⁸ Contrasting these input conditions will provide a powerful database needed to address questions about the effectiveness of various types of CF.

3.4.4 Input properties: transparency and frequency

The VILLA project followed previous first exposure studies described in Chapter 2 by maintaining two variables constant throughout the two variants of input presentation and for all learner groups: transparency and frequency of an item in the input. Criteria for these two variables replicated prior LV methodology at first exposure (Rast 2003, 2008; Gullberg et al. 2012). These variables were held constant when preparing the input scripts and also during the actual delivery of the Polish courses.

*Transparency*⁵⁹

A variable known to play a crucial role for comprehension and lexical learning is the transparency or cognate status of lexical items (Berthele & Lambelet 2009; Carroll 1992; Rast 2008; Singleton 1999).⁶⁰ Robust transparency effects have been found in recent first exposure studies (e.g. Carroll 2012b; Rast 2008; Rast & Dommergues 2003; Shoemaker & Rast 2013), as highlighted in Chapter 2.

Based on the methodology developed in Rast (2008), transparency in the VILLA project was measured by means of a translation test administered to native speaker control group participants with similar profiles to those of our learners in all countries of the project. Participants listened to Polish words recorded by a native speaker, and were asked to translate (in writing) any word they felt they could. Items that were translated correctly by at least 50% of the participants in each country were considered “transparent” for the purposes of the VILLA experiments. These words resembled translation equivalents in all five L1s as in

⁵⁸ It is important to note here that, to date, the instructor’s input in all countries has been transcribed; however, it has not yet been analyzed for “input condition”. Although the project planned clear differences between the input conditions, only a close examination of the “real input” can confirm this distinction.

⁵⁹ The Transparency test was designed by Rebekah Rast and Agnieszka Latos.

⁶⁰ The term “transparency” is preferred over “cognate” in that it emphasizes the project’s focus on the learner; the focus of this research is not etymology, but rather the “psychotypology” of the learner, i.e., what the learner perceives as the same or different in the source and target languages (Kellerman 1983).

the example *fotografem* (“photographer”, “photographe”, “fotografo”, “Fotograf”, “fotograaf”). The project teams collaborated in developing a list of “opaque” items. These Polish words differ significantly from their translation equivalents in all five L1s, as in the example of Polish *tłumatczka* (“interpreter”, “interprète”, “traduttrice”, “Dolmetscherin” and “tolk”).

Valentini and Grassi (2014, 2016) conducted an initial analysis on the transparency test results of the Italian native speaker control group, in which participants heard Polish words and were asked to translate them into Italian. Results show that the level of phonological similarity between a Polish syllable and its corresponding Italian syllable is a good predictor of accuracy scores. The results align with learner variety hypotheses where L1 lexical knowledge is commonly transferred (e.g. Giacobe 1992; Kellerman 1979, 1980, 1995; Klein 1989) and results from Rast and Dommergues’ (2003) sentence repetition study where phonemic distance affected learners’ ability to repeat sentences in Polish. This analysis will be conducted in other project countries as well for purposes of cross-linguistic comparison. Clearly we have known about the positive effects of cognate status for decades (Carroll 1992). The purpose for examining this variable in the VILLA project is partially for control purposes, but also to explore under what conditions, at what level of proficiency and in what contexts transparency is more or less beneficial for learning.

Frequency

As discussed in Chapters 1 and 2, frequency is an integral component of usage-based theory as evidenced by robust effects in first and second language acquisition studies. In the very early stages of exposure, however, the role of frequency is not yet decisive (see Gullberg, Roberts & Dimroth 2012; Shoemaker & Rast 2013). Some studies have also found limited effects of frequency (e.g. Carroll 2012b) or a delayed effect of frequency (Rast & Dommergues 2003; Rast 2008).

In the VILLA project the pre-established frequency of a lexical item was operationalized as more than 20 tokens of the word in the input as per the methodology established in Rast (2008).⁶¹ The “real” frequencies of all items that appeared in the Polish input will be calculated using the CHILDES coding tools. It will then be possible to indicate for every test item (e.g. word, lemma, inflectional morpheme) how often it was encountered by each learner group. For analyses in progress, frequency has, in some cases, been simplified to a distinction between “present” (with a set minimum) or “absent” in the input, while in other cases the “real” frequency count is used in the analysis. In addition to the frequency of

⁶¹ Results of studies conducted by Rast and colleagues cited in Chapter 2 and VILLA results cited later in this chapter also introduce “real” frequencies and criteria established for counting frequencies of case marking for example.

target words, frequencies will also be calculated for inflectional markers in order to examine type-token frequencies (Ellis & Collins 2009) and for word orders.

Criteria for both transparency and frequency were established during the experimental design phase, well before the data collection phase, in order to distribute words evenly across categories when designing experiments. As a result of this preparation, four categories of words with respect to transparency and frequency are controlled in the entire input dataset and in many of the Polish tasks: transparent/frequent, transparent/absent, opaque/frequent, and opaque/absent. In addition to controlling input features such as transparency and frequency, the project controls a variety of linguistic features through a VILLA-developed coding system,⁶² which makes use of CHILDES coding tools (MacWhinney 2000). The system codes the transcribed input for not only transparency and frequency, but also for word classes, such as noun and adjective, and for grammatical categories such as number, gender, and case. The same system will also be able to code the learners' productions once the transcriptions become available.

The following is an example of an utterance produced by the teacher in class and coded using CHILDES and the internal VILLA coding system:

*TEA: Leon jest Norwegiem .
 %mor: Nn|Nom-Mas-Sg=Name:first-name Vc|3-Sg=być:be
 No|Ins-Mas-Sg=Norweg:Norwegian:T-F.⁶³
 (Leon is Norwegian.)

3.4.5 Learners' and the teacher's productions in the classroom (equipment, transcriptions and coding of the input)

Several pilot studies in which learner productions were recorded (some more successfully than others) aided the VILLA research teams in selecting appropriate equipment. It was clear, in particular, from the data collection at the University of Paris 8 (reported in Rast et al. 2014 and Shoemaker & Rast 2013) that the project needed equipment that would allow for high-quality time-synchronized recordings of the Polish instruction, including both teacher and learner productions. This step was crucial in order to guarantee audio-recordings that could be properly transcribed and learner productions that could be analysed relative to other productions, those of the instructor and/or those of other learners.

It follows that the project selected high quality multichannel recording equipment (Macbook HD recording with RME Fireface and Presonus preamps)

⁶² A special thanks to Christine Dimroth and Romuald Skiba for developing this coding system.

⁶³ For more information, take the example of the word *Norwegiem* in Polish (No|Ins-Mas-Sg=Norweg:Norwegian:T-F). As per the coding system, the word is a noun (No) in instrumental case. It is also marked for masculine and singular. *Norweg* is the stem and the word with its ending means "Norwegian". The word is transparent (T) and frequent in the input (F).

with a table microphone (Audix) for each learner and a wireless microphone (Dpa) for the instructor.⁶⁴ The speech of the instructor and each learner was recorded separately in the software program ProTools and synchronized in order to align all tracks in time. Depending on the layout of the classrooms, two to three video cameras were used in order to film the instructor and the learners from different angles. These data are being transcribed, and transcriptions will be used to examine learners' interactions with the classroom input.

All classroom sessions in all countries were audio-recorded using the same multichannel recording equipment. Twenty table microphones for learners and a wireless microphone for the instructor were connected to the software program ProTools to record and synchronize tracks.

To close this section on methodology, suffice it to say that the beauty of the VILLA database lies in the opportunity to compare complete input exposure with learner performance. This is a rich and rare database, and one that will offer data for research in foreign language acquisition well into the future.

3.4.6 Polish tasks and learner performance

The Polish tasks and tests of individual variability were also carefully prepared. Polish tasks, designed to test different linguistic domains from phonology to discourse, were administered regularly and included well-known elicitation tools used in acquisition studies, such as "Finite Story" (Dimroth 2012), or were created using E-prime (Schneider, Eschman & Zuccolotto 2002), or other procedures. Tests of individual variability were selected and translated into learners' native languages when necessary.

Analysis of the instructor's Polish input only becomes interesting when compared with the performance of the learners. In order to make this comparison, several steps were essential: 1) recordings of the instructor's input; 2) recordings of the learners during the Polish course; 3) a regular assessment of the learners' progress in Polish over time.

All tests required impeccable collaboration between all VILLA members.

This section lists the 12 Polish tasks performed by all learners of the project (more details can be found in Dimroth et al. 2013 and in publications reporting on results of a specific task as described in the following section). Most tasks were administered at several time periods (from 2-5 times throughout the Polish course), whereas some were administered only once after the final Polish lesson. As a reminder, all tasks allow an investigation into research questions 1-4, and some go beyond to address additional questions.

⁶⁴ We extend a special thanks to Beryl and Bart Hilberink for their recommendations regarding equipment and for obtaining the equipment and coordinating its use and transport across all project countries throughout the entire data collection period.

The following are the Polish experiments and elicitation tasks used to document the acquisition process:

Word learning/the lexicon, phonology, morphology

1. Phoneme Discrimination
2. Lexical Decision
3. Word Recognition

Morpho-syntax

4. Grammaticality Judgement (nominal case)
5. Oral question-answer task (nominal case)
6. Grammaticality Judgement (subject-verb agreement)
7. Picture Verification (morpho-syntax; argument roles)
8. Sentence Imitation (morpho-syntax; argument roles)
9. Fill-in-the-blank written test (personal pronouns)
10. Sentence Puzzle (word order)

Discourse/Information structure

11. Elicited production: route direction (oral discourse)
12. Elicited production: film retelling (oral discourse)

3.5 The VILLA database: Results

To date, while limited results have been published, numerous papers have been presented at conferences reporting on VILLA results, and many analyses are in progress. This section reports on a selection of results published or presented as of the date of this document, and only those studies in which I have been involved as author and/or task designer.

3.5.1 Perception, segmentation, word recognition⁶⁵

Several tasks were designed to document the learners' performance when confronted with a novel speech stream and their lexical development. We begin with tasks that require lower-level processing as introduced in Chapter 2, such as distinguishing unfamiliar phonemes and extracting "words" from the speech stream.

Phoneme Discrimination Task⁶⁶

Shoemaker and Rast (2014) and Shoemaker (2014) tested the ability of learners to discriminate non-native sounds at three time intervals. Polish attests more fricatives and affricates than any of the learners' background languages, making it an ideal TL to investigate the acquisition of non-native phoneme contrast. With

⁶⁵ Reports of findings of additional tests in this category are on-going, e.g. van Bergen, Dijkstra & Hilberink-Schulpen (in progress) on Lexical Decision data; Saturno (forthcoming) on Sentence Imitation data.

⁶⁶ The Phoneme Discrimination task was designed by Ellenor Shoemaker (Shoemaker 2014).

respect to low-level perception, Shoemaker and Rast were interested in knowing when learners would be able to perceive phonological distinctions, if at all.

To date, only data collected from native speakers of French have been analyzed. In their analyses of the French data, Shoemaker and Rast tested Best's (1995) Single-Category Assimilation, predicting that the Polish alveopalatal and retroflex contrast would initially be assimilated into French palato-alveolar sibilants. Participants completed a reaction-timed Phoneme Discrimination task using E-prime (Schneider, Eschman & Zuccolotto 2002) at three time intervals: T1 (0 hours of input), T2 (4.5 hours of input) and T3 (10.5 hours of input). Learners heard pairs of CV non-words (syllables) that were either identical or differed in exactly one phoneme. They were asked to indicate if the syllables were similar or different by pressing the relevant button. The pairs included six sibilants from the Polish phonemic inventory followed by /a/ (the corresponding Polish orthography appears in parentheses): /sa/ (*sa*), /za/ (*za*), /ɕa/ (*sia*), /ʒa/ (*zia*), /ʂa/ (*sza*), /ʐa/ (*rza*). The prediction is that /ɕa/ and /ʂa/ will be assimilated to French sibilant /ʃ/, and /za/ and /ʐa/ to French sibilant /ʒ/.

Data were first analyzed to verify whether a difference appeared between performance of learners in the MB and those in the FB input groups. No statistically significant difference was found. The data from both groups were combined for further analyses. Results from accuracy analyses over time intervals showed no significant improvement in accuracy between performance at first exposure and performance after 4.5 hours of instruction, suggesting that 4.5 hours was insufficient exposure for learners to develop novel phonemic categories. After 10.5 hours of instruction, however, a significant difference was found between performance at first exposure and performance after 10.5 hours of exposure. Looking more closely at the pair combinations, pairs distinguished by voicing posed little to no problem for the learners; however, pairs distinguished by place of articulation were much more challenging, and performance on these items was below chance at all time intervals. As predicted, the Single-Category Assimilation hypothesis was borne out. Results suggest that native speakers of French assimilated the Polish alveopalatal and retroflex sibilants to French palato-alveolar categories /ʃ/ and /ʒ/, making it difficult for them to discriminate the two phonemes. These results reveal the challenges of acquiring a new phonemic system, but also show a rapid and significant increase in the ability of these speakers to discriminate non-native sounds after only 10.5 hours of exposure to Polish, in support of an important role for the input as found in statistical language learning studies, such as Saffran et al. (1997).

In sum, even though native speakers of French showed improvement in phonemic discrimination, their poor performance indicates that novel categories may not have been formed. Follow-up studies would need to go beyond the first 10.5 hours of exposure to observe at precisely what point such novel categories begin to form and stabilize. Analyses of data from the other L1 groups may also

shed light on the question of when and how learners develop novel phonemic categories.

*Word recognition task*⁶⁷

Moving beyond sound distinctions to “words”, the Word Recognition task, based on the study of word recognition reported in Shoemaker & Rast (2013), was designed to investigate learners’ ability to extract words from the Polish speech stream at first exposure, to observe development over time, and to identify the factors that aided learners in this extraction. Participants were tested using E-prime at three time intervals: T1 (0 hours of input), T2 (7.5 hours of input) and T3 (13.5 hours of input). Participants heard a series of sentences in Polish, each followed by a Polish word in isolation. They were asked to indicate whether the word in isolation was present in the sentence they had heard or not. Words were coded as +/- transparent and +/- frequent (see Section 3.4.4 for details) in order to investigate the role of these variables on learners’ ability to extract information from the speech stream. As a reminder, Shoemaker and Rast (2013) found that words in initial and final position were better recognized than words in medial position. In order to investigate more closely other effects in word recognition, all words in this new version of the Word Recognition task appeared in sentence medial position. Learners performed this task once before the Polish course began (T1) and again after 7.5 hours (T2) and 13.5 hours (T3) of instruction.

Analyses of data collected from adults in France, Germany, the Netherlands and Italy show some L1 effects and complex interactions between variables (van Bergen, Rast, Shoemaker 2014). The German adult participants scored lower than French participants when tested before the Polish course began; however, 7.5 hours of exposure was sufficient to bring the German group up to the same performance level as the French groups. In fact, results show a significant increase in the ability of learners from all source languages to extract Polish words from the speech stream after only 7.5 hours of exposure, in line with Shoemaker and Rast’s (2013) results, which show that learners improved on the piloted task after only 6.5 hours of exposure. A strong effect of frequency was also found in the VILLA version of the task at T2 and T3 across groups, with frequent words better extracted than absent words. These latter results are not in line with findings reported in Shoemaker and Rast (2013), where frequency on a word recognition task did not show an effect after 6.5 hours of exposure. Rast and Dommergues (2003), however, did find an effect of frequency in a sentence repetition task after 8 hours of exposure (but not yet at 4 hours). These results clearly provide additional support for claims made about the important role of frequency in language acquisition by the emergentist and usage-based

⁶⁷ The Word Recognition task was designed by Ellenor Shoemaker, Rebekah Rast and Agnieszka Latos.

frameworks, at least after 7.5 hours of exposure; however they do not lend support to the claim that frequency plays an immediate role in the very first minutes or hours of exposure, in contrast to results reported in Zwitserlood et al. (1994/2000) and in Gullberg, Roberts and Dimroth (2012), albeit combined with gesture. The Word Recognition task results suggest that something other than frequency may be responsible for the initial learning that has taken place, as per Carroll (2012b) and Shoemaker and Rast (2013). As mentioned earlier, the study of frequency effects in early exposure to a foreign language will require future collaboration where, across studies of various source and target languages, frequency will be operationalized in the same way, and participants will perform the same series of tasks for comparative purposes.

The effect of transparency on learners' ability to extract words from the Polish sound stream was found to be complex and varied with source language group. Taken together, transparency showed strong effects; performance on transparent words was better than performance on opaque words at all time periods. This finding of robust transparency effects confirms results from previously conducted experiments using sentence repetitions and word recognition tasks (Rast and Dommergues 2003; Shoemaker & Rast 2013), as well as other first exposure research (Carroll 2012a, 2012b; Han & Liu 2013).

With respect to L1 influence, French and Italian learners performed better than Dutch and German on transparent words before instruction (T1). Properly interpreting this finding of L1 group difference will require further investigation. A fine-tuned analysis of the Transparency Test results should shed light on the linguistic nature of the transparent words that were better recognized by certain L1 groups, leading to a better understanding of what aspects of "transparency" helped learners accomplish the task. For example, are these differences related to phonemic similarity with respect to the L1, as Rast and Dommergues (2003) discovered in their sentence repetition data? Opaque items that were more readily extracted over time will also be analyzed for phonemic similarity/distance to the L1 and other L2s known by the VILLA learners.

What do these findings tell us about how words are extracted from a novel speech stream? Clearly, extracting meaning from a string of sounds (through lexical transparency) helps learners recognize "words". The different transparency effects indicate that the usefulness of lexical transparency in extracting words from the input is relative. Further analysis of the role of phonemic distance is necessary to better understand this transparency effect (as per Rast & Dommergues 2003).

3.5.2 Morpho-syntax

This section builds on the first exposure research reported in Chapter 2 Section 2.3.2. Following analyses of prior data collections, several questions remain, in

particular how learners process and begin to use a novel morphological system and to what extent constituent word order affects their sentence processing.

*Grammaticality Judgment task (nominal morphology)*⁶⁸

A Grammaticality Judgment task was designed to investigate learners' ability to judge the appropriateness of case and gender inflection on Polish nouns within simple sentence structures. This test was piloted several times in paper-pencil versions (Rast, Watorek & Hilton 2010) and once on computers (Rast et al. 2014). VILLA participants were tested using E-Prime at two time intervals: T1 (4.5 hours of input) and T2 (10.5 hours of input). Participants heard a series of sentences in Polish and for each sentence were asked to report whether the sentence was grammatical or not. The stimuli included two types of Polish copula constructions: 1) a double nominative in which a nominative noun in the predicate was used in the incorrect context, or 2) a correct construction with a nominative and an instrumental noun in the predicate. Both constructions also indicated gender (masculine or feminine). As with the Word Recognition task, this experiment included +/- frequent and +/- transparent items.

Results reported in Hinz et al. (2013) on the French and German MB group data revealed some ability of French and German adult learners to judge the accuracy of Polish nominal morphology. When comparing accuracy between the two L1 groups, results showed that the German learners significantly outperformed the French learners when judging noun endings at the first testing interval (the French group caught up at T2). The finding that case and gender markers in Polish noun inflections were initially more difficult for French native speakers to judge than for German native speakers may be explained by the fact that German attests case marking on nouns and determiners, even if limited, whereas French does not. Analyses of the variables transparency and frequency show complex interactions. No effect of frequency (based on word tokens) was found in the grammaticality judgment test for either group at either test time. A robust effect of transparency was found, however, for the German group, especially at T2. In the French data, interactions between transparency and frequency were observed, and the native speakers of French were found to significantly improve on the identification of correct absent/opaque forms, indicating a potential ability to generalize morphological marking to completely novel items where no recognizable surface form is attested in the L1. In order to respond fully to claims made by usage-based theorists, analyses of type frequency need to be conducted on these data (as proposed by Hinz et al. 2013). The German group performed at

⁶⁸ The Grammaticality Judgment Test (nominal morphology) was designed by Rebekah Rast, Agnieszka Latos, Ellenor Shoemaker and Marzena Watorek. The test is available on IRIS digital repository for replication:

<https://www.iris-database.org/iris/app/home/search?query=hinz>.

a high level already at T1, which may explain why no such difference was found in the German participant data.

Rast, Watorek and Latos (2015) performed additional analyses on the French MB Grammaticality Judgment task data and found that learners were able to judge grammatical sentences better than ungrammatical sentences at both time intervals, suggesting some internalization of input-relevant structures. As seen above, access to meaning helped learners to judge grammatical accuracy. When examining the results of grammatical sentences only, the authors also found an interaction between frequency and transparency. Essentially, low transparency was found to provoke a lower score. When the target word was absent from the input but transparent, learners' accuracy was quite high (89% accuracy at T1, 93% at T2). When the target word was absent and opaque, the score dropped (68% at T1, 78% at T2). In other words, and not surprisingly, transparency helped learners judge items that were absent from the classroom input. It appears that access to meaning helped learners acquire form, a variation on VanPatten's (2004: 14) Primacy of Meaning Principle, in which learners are assumed to process input for meaning before they process it for form. The current results do not necessarily support the claim that learners process meaning before form; rather, they suggest that meaning facilitates the processing of form.⁶⁹ These results appear to be in line, to a certain extent, with Doughty (1991). The learners in her study who had additional support for comprehension showed greater gains in their acquisition of relative clause structures than those who did not receive the extra support.

Watorek et al. (2017) analyzed the French MB and FB Grammaticality Judgment test data for results on the instrumental forms only. Results of analyses on frequency, transparency, gender and test time showed no differences between the two groups, suggesting that the focus on structural properties of the input was not particularly beneficial for performance on this task. A difference was found, however, in reaction times: overall the FB group showed slightly slower reaction times than the MB group. We will return to these results in Chapter 4.

In another study, which examined the L1 German and L1 English Grammaticality Judgment data for similar signs of cross-linguistic influence as indicated in the German and French data, Ankone (2015) found that the German group performed better than the English group at both test times, and that neither group improved significantly between T1 and T2. As with the French data, Ankone found that the German learners of Polish scored higher on the grammatical items than the ungrammatical ones, and that the German group

⁶⁹ Note that forms may also be processed before meaning. Take for example an L2 learner of English who hears the -ing morpheme on a stem. This -ing form might trigger the information that the stem is a verb, which might in turn trigger semantic information for the learner that would not have been triggered without the -ing form).

scored better on the ungrammatical items than the English group, suggesting that the German native speakers may have benefitted from their L1 knowledge of case marking to recognize correct forms and reject incorrect forms. The English language provides no opportunity to develop knowledge about case marking, at least in the form of word endings. Ancone concludes that the German group transferred knowledge of their L1 to accomplish the task in Polish, whereas the English had no relevant knowledge to transfer, and were therefore less successful in judging the accuracy of case marking in Polish.

Although the use of grammaticality judgment tests as a measure of what learners can do with the TL has been criticized in the literature as being less than ideal ecologically speaking, the strength of this methodology at the early stages is that “production” is not required. Judging the accuracy of an utterance is a receptive task that mobilizes both implicit and explicit knowledge about the TL (see Chapter 4 Section 4.3.1.1 for a more detailed discussion). In the LV approach to SLA, the developing variety is viewed as “error free”, meaning that analyses of learner productions seek to describe a given learner variety at a given point in time in the acquisition process. Comparisons are made between a learner’s productions over time in order to observe and describe language development, or between different learners to observe and describe differences and similarities that may be due to factors such as source language or age. Where do incorrect sentences in a grammaticality judgment test fit into this paradigm? Given that the VILLA project controlled and documented the TL input addressed to the learners, we were able to numerate the correct occurrences of structures in the input and use these as a baseline for the grammaticality judgment test. It follows that either learners would take in these structures and recognize them as structures from the input, or they would not. If they could do this, it would suggest that they had learned something about the morphological structure of Polish in limited contexts. We also wanted to know if they could generalize what they had learned about Polish morphology to new items that did not appear in the input. We imagine that what appears in the input is considered by the learner as the “correct” version, so asking learners to identify what seems to be correct in a stream of speech is like asking them what sounds familiar or what looks like something they have seen before. But are they able to take what they know about structure and apply it to new lexical items? Our findings suggest that in some cases they are. In order to strengthen these findings, knowledge about morphology, independent of context, could also be tested by means of a recognition task. For future research, it would be interesting to create stimuli comprising correct morphological markers and pseudo morphological markers (non-words) where the task is to identify which words are Polish and which are not. This would allow access to learners’ knowledge about Polish lexical items, i.e. what inflectional marking their developing systems allow or reject.

*Oral Question-Answer Task (nominal morphology)*⁷⁰

The Oral Question-Answer task investigated learners' ability to use nominal morphology appropriately on Polish nouns in simple sentence structures (Hinz et al. 2013). This test, piloted and reported on in Rast et al. (2014), was designed in parallel with the grammaticality judgment test in order to compare learners' receptive and production skills in Polish on the same types of grammatical structures and lexical items. As a reminder, the Rast et al. (2014) pilot study also compared grammaticality judgment and production results; however, the tests were not administered after the same amount of input. In the VILLA study, the quantity of the input was controlled in order to compare test results based on the same amount and type of input exposure.

The test was administered to each VILLA learner individually. Learners saw a male or a female figure on a screen and heard a pre-recorded question asking for the person's profession or nationality (simple copula sentences based on the sentences used in the grammaticality judgment test). The questions came in one of two formats, requiring a noun phrase with either the nominative or the instrumental case in the answer. After hearing the question, the learner was presented with a picture symbolizing a profession or a nationality on the computer screen. The learners' task was to answer the question with a simple affirmative copula sentence, stating which profession or nationality the person had. As with the Grammaticality Judgment task, the lexical material included a balanced mix of present or absent (in the input) items and transparent or opaque items. This production task, administered according to the same program as the Grammaticality Judgment task (i.e. after 4.5 hours of instruction – T1 - and again after 10.5 hours – T2), taps several processes. To accomplish the task successfully, learners must be able to access and produce the appropriate lexical items and morphological markings, and to do so in a specific context.

Hinz et al. (2013) found that French and German adult learners could produce elicited Polish words with their correct inflections with very little exposure and improved significantly in this ability between T1 and T2. In this test, the German learners did not significantly outperform the French learners as they did on the Grammaticality Judgment task. These differences in results based on L1 and task suggest that a source language effect may be task dependent. This is not surprising; it is merely a reminder that generalizations about the effects of various factors on language acquisition must be limited to the specific type of task at hand and to the language skill or domain it is testing.

Of particular interest in these early production data are the results concerning frequency and transparency. Frequency played a strong role in the correct productions of learners in both groups and at both test times (more present

⁷⁰ The Oral Question-Answer task was designed by Marzena Watorek, Agnieszka Latos and Rebekah Rast.

items were produced correctly than absent items). Note that these results differ drastically from the judgment results, where no effect of frequency was found. Transparency effects, however, were more nuanced. Contrary to predictions, opaque items were better produced than transparent ones by both groups at both test times. The authors introduce the constructs of noticing and attention as possible explanations for this unexpected result: "...learners were able to notice the regularity of endings on opaque words more easily than endings on transparent words given that transparent words required less attention during the Polish classes and during testing. In the case of opaque/present words, the stem and the inflectional marker are either learned together or the stem is learned as an item attached to an already familiar marker, in which case the stem requires the learner's attention. In the case of transparent words, the stem is already familiar, so it is the ending that needs to be learned, in which case the marker requires the learner's attention". It appears, however, that saliency of the noun ending may have played a more important role than the transparency of the noun stem. The authors argue that the instrumental case forms, *-em* (masculine) and *-ą* (feminine), are more salient than the nominative case forms, *-∅* (masculine) and *-a* (feminine), which would explain why learners in both L1 groups performed better on instrumental items than nominative items. Finally, opaque items present in the input put demands on memory processes in that, in order to accomplish this production task, the meaning of these words needs to be retrieved. The study of frequency and transparency effects will clearly benefit from on-going research on noticing and attention in SLA (e.g. Godfroid & Uggem 2013).

*Picture Verification task*⁷¹

The Picture Verification task was designed to investigate learners' ability to interpret Polish sentences of various word orders and to observe whether learners relied mainly on word order or also on morphological case marking when trying to interpret the meaning of a sentence. In this task participants listened to pre-recorded Polish transitive sentences in SVO, OVS or OSV word order. The following are examples from the test:

1. SVO – *Siostra woła brata* (sister.NOM calls brother.ACC)
2. OVS - *Brata woła siostra* (brother.ACC calls sister.NOM)
3. OSV - *Brata siostra woła* (brother.ACC sister.NOM calls)

All three sentences mean, "The sister calls/is calling the brother".⁷² Word order is pragmatics driven in Polish, so although SVO is the dominant (neutral) word

⁷¹ The Picture Verification task was designed by Marzena Watorek in collaboration with Rebekah Rast and Agnieszka Latos.

order, other word orders, often accompanied by context specific stress patterns, are provoked by specific contexts, such as in the following example: *Kto woła brat: mama czy siostra?* (**Who** calls the brother: mom or sister?). This question elicits a reply with OVS word order, such as in Sentence 2 above and repeated here: OVS - *Brata woła siostra* (brother.ACC calls sister.NOM) (It is the sister who calls the brother).⁷³

Each sentence was accompanied by two pictures depicting the two protagonists involved in the action. One picture showed the event with the agent and patient roles expressed in the sentence; in the other picture the agent and patient roles were switched. The test was administered to participants at two time intervals: T1 (9 hours of input) and T2 (13.5 hours of input). In preliminary findings across all adult MB groups (with the exception of the English native speakers), Starren et al. (2013) found that the German adult group scored better than the French, Dutch and Italian groups when interpreting OVS and OSV sentences, suggesting that the German learners made use of their L1 property, case marking, when interpreting sentences in which noun endings must be analysed for information about agent and patient roles. These results support research conducted within the functionalist Competition Model paradigm (Bates & MacWhinney 1981, 1987) and confirm, once again, a role for the L1 in certain tasks at the initial stages of foreign language acquisition.

*Sentence Puzzle Task*⁷⁴

Data collected from the sentence puzzle task, a written task, were based on the methodology developed in Rast (2008) and (Rast, Watorek & Hilton 2010) and prior research conducted on negation and focus particles (e.g. Bernini 2000; Dimroth 1998; Watorek & Dimroth 2005). The task was administered at two time intervals: T1 (7.5 hours of input) and T2 (12 hours of input). Participants were asked to read pairs of semantically related sentences, in which the second “sentence” – or rather string of words in a scrambled order - contained a negation or a focus particle (e.g. *nie* “not” or *również* “too”). Learners were asked to reshuffle the words in the second sentence into the appropriate Polish word order and translate the newly created sentence into their L1. The aim was to observe a potential influence of source language or other known L2s and the frequency of particular word orders in the Polish input on learners' preferred word orders.

⁷² Note that SOV is also a possible constituent word order in Polish, e.g. *Siostra brata woła* (sister.NOM brother.ACC calls), but the effect of this word order was not tested in this task.

⁷³ It is important to highlight here that these task items are simplified artificial Polish sentences. In spontaneous use, discourse context is much more complex and word order changes are consistently pragmatically motivated.

⁷⁴ The Sentence Puzzle task was designed by Rebekah Rast, Marzena Watorek, Agnieszka Latos and Christine Dimroth.

First results were analyzed by Ruesen (2013) on the Dutch MB and FB data. Taken together, they show little to no L1 influence in the placement of the negative particle. Learners quickly produced the Polish Neg-V order rather than the dominant Dutch V-Neg structure, in line with Rast's (2008) findings that after only 3.5 hours of exposure to Polish, most French participants placed the Polish negator *nie* in the appropriate pre-verbal position as opposed to the dominant post-verbal position found in French (*V-pas*).⁷⁵ It was with less exposure, after only 1.5 hours, that Rast (2008) found different learner hypotheses with respect to this phenomenon. Due to the large number of tests administered in the project, learners did this task quite late in the Polish sequence. Apparently, 7.5 hours of input was sufficient exposure to acquire the TL Neg-V order when structuring simple written sentences.

This said, however, a comparison between the placement of the Polish negator in the Sentence Puzzle task and the Grammaticality Judgment (verbal morphology) task (administered after 14 hours of Polish instruction) for Dutch MB and FB groups showed a task effect, that is, that the learners' preferred position for the Polish negator *nie* differed depending on the task (Ruesen 2013). In the Sentence Puzzle task, learners favored the Neg-V order, whereas in the Grammaticality Judgment task, they preferred the V-Neg order (i.e. learners indicated that V-Neg order was more often correct than Neg-V). Ruesen warns her readers, however, that this interpretation must be carefully considered. In fact, in the judgment task, learners may have accepted V-Neg as correct even though it was not their order of preference (more easily expressed in the Sentence Puzzle task). This result is again a reminder of the importance of considering the task at hand when coming to conclusions about what learners are or are not able to do when confronted with the TL.

3.5.3 Information structure

A Route Directions task and the Finite Story task, both administered on the last day of the Polish course, after 14 hours of instruction, allowed for observation of learners' productive oral discourse in Polish. Both tasks were individually recorded, and the recordings were subsequently transcribed and coded by a native speaker of Polish.

*Route Directions Task*⁷⁶

Following Watorek, Rast and Hilton (2011) and building on the opportunity to analyze learner production, Route Directions is a task that requires learners to indicate an itinerary. In this task, learners were given a simplified city map with a starting point (point X), a target location (point Y) and landmarks, such as public buildings and street names. The investigator asked the learners for

⁷⁵ See Rast (2008) for a discussion of these results in light of the debate about French negation.

⁷⁶ The Route Directions task was designed by Marzena Watorek.

directions from point X to point Y. In response, learners tried to produce a coherent discourse containing mainly spatial information. This type of discourse was repeatedly practiced in the final four classroom sessions (lessons 7-10) before administration of the test at the end of the course, following lesson 10. Rast et al. (2015), who analysed data from the L1 French, German and English MB groups, were interested in knowing to what extent a highly instructional and repetitive input might override or neutralize L1 effects and other L2 knowledge on learner productions in Polish. Analyses reveal some input effects, but L1 effects were also observed, as were other processes independent of L1 and TL properties. In particular, all groups showed a fairly high rate of base form nouns in their productions, a result that is in line with the ESF project (Perdue 1993) whose learners produced little inflectional morphology. In addition, L1 groups differed in their overall use of nominal morphology in Polish with the French group producing more correct and idiosyncratic morphological forms than the German and English groups. With respect to discourse characteristics, the L1 German learners of Polish put more information in the side structure⁷⁷ than did the L1 French or L1 English learners, following the structure of their L1s as confirmed by control group data. The study did not identify clear traces of other L2 influence on L3 Polish.

Rast, Watorek and Latos (2015) looked more closely at the French MB Route Directions data to investigate how the French learners of Polish used the Polish input to begin to make productive use of nominal morphology. As mentioned above, prior research has shown that at the early stages of L2 acquisition, learners tend to use the base form in all contexts (e.g. Bardovi-Harlig 1992; Starren 2001); however, on this challenging production task after only 14 hours of input the authors observed the emergence of a variety of different morphological forms for the same lexical item, some attested in Polish and some not, some seemingly capturing the pragmatic value of the utterance and some not. These data reveal the complex work that learners did on the input in order to meet the challenge of the tasks, revealing not only the complexity, but also the “creativity” (Klein & Perdue 1997) of their emerging systems.

Finally, another study using data from the same Route Directions task (Watorek et al. 2016) investigated the role of the L1 versus the role of the Polish input in the directions produced by French and English MB learners. This study looked specifically at learners’ discourse structure, and took as its starting point Perdue’s (1993) observation that the BV can be considered a compromise between the conceptualization of a complex task that constitutes a certain type of discourse construction and the linguistic means available to the learner at any given time. Using the model of the *Quaestio* (Klein & von Stutterheim 1991) combined with the Talmy’s typology of motion events (2000) (see also Demagny

⁷⁷ Based on the model of the *Quaestio* (Klein & von Stutterheim 1991)

2015), this study seeks to understand what this “compromise” looks like in learners at the initial stages of L2/L3 acquisition. In other words, the learner may know what he/she wishes to say in the TL (the conceptualization is intact), but in order to actually express this conceptualization, the learner will need to search the TL input for the available linguistic means to do so. To be successful, this process requires form-meaning/function mapping. As everyone seems to agree, the forms and structures in the input need to be linked to meaning for language acquisition to occur. According to functionalist theory, “function” must enter the mapping paradigm as well. Watorek et al. (2016) found that the linguistic choices that the learners made were influenced by properties of their L1, following Hendriks (2005), who points out that these choices may be conditioned by the organization of spatial concepts that depend on L1 properties. Further analyses of these data and Route Directions task data from other VILLA project countries will provide insight into this question. Ultimately the VILLA project seeks to go beyond the study of traces of L1 at the morpho-syntactic level and, as such, explore the influence of the L1 at the level of information organization in complex discourse.

*Finite Story*⁷⁸

The Finite Story task (Dimroth 2012) was also administered to learners after the final Polish lesson. Learners were recorded individually, and recordings were transcribed and coded by native speakers of Polish. In this task, learners view short video clips, and following each clip, are asked to recount what they saw. Lexical items needed for this task were introduced as of the first Polish lesson and repeated in the input throughout the course. Some concepts found in the video clips, however, were deliberately not introduced in the instructional input to observe how learners would make use of their linguistic and cognitive resources to communicate these concepts in the absence of the necessary TL knowledge. Given that I was not involved in the development or analyses of this task, I will not report details here. Some results are discussed in Section 3.6 of this chapter.

3.5.4 Individual differences

Essentially the purpose of these data is two-fold: 1) as control data to rule out potential differences between learners when possible; 2) to observe the effects of differences, if any.

Although all project teams agreed on the importance of collecting these individual differences data, it is important to note here that priority in the VILLA project was given to the collection and organization of linguistic data, TL Polish in this case. This said, individual differences data were gathered over the two-

⁷⁸ Finite Story was designed by Christine Dimroth (see Dimroth 2012).

week data collection period for each group, a monumental task. Although Hilton (2016) rightly describes the dataset as “modest”, it is more complete than most individual differences databases in SLA research.

Descriptions of the raw data for the VILLA individual differences tests from all project countries is close to complete, and results are being recorded into one large VILLA individual differences spreadsheet that, once complete and approved by all countries, will no longer be modified. Researchers interested in investigating the role of specific variables on learner performance in Polish or during classroom interaction will have access to the relevant data in the spreadsheet.

Preliminary statistics have been conducted on some of the data. Roberts and Marsden (2013), for instance, analysed data of several receptive tests from the English database and found that grammatical inferencing ability - but not phonological awareness - was associated with both learners' successful word recognition and their sensitivity to Polish nominal morphology. Hilton (2016) ran exploratory statistics of selected data across groups, which revealed some differences. She emphasized the importance of examining other factors that may be responsible for these differences. She also highlighted the “precious information on links between classroom behavior and the variables measured (attentional capacity, motivation, intelligence, metalinguistic skill, learning style)”. Analyses of the latter type will be particularly useful for research focused on the language acquisition and teaching interface.

Without a doubt, future studies would benefit from integrating research questions about individual variability and data collection alongside questions about linguistics in their overall project design.

3.6 Research questions: a response

We return briefly to the questions posed by the VILLA project as delineated at the beginning of this chapter. In Chapter 5, the concluding chapter, I will respond more widely to the larger questions introduced in Chapters 1 and 2.

Questions across all project teams and participant groups

RQ1. *The L2/L3 initial state* - What is a learner capable of perceiving, comprehending, and producing in a novel TL at first exposure? What processes are active even *before* learners are able to express themselves in the TL by means of non-formulaic constructions?

First and foremost, findings from research on the initial stages of L2/L3 acquisition conducted within the LV framework, including research reported in this chapter from the VILLA project, have led to a redefinition of the “L2 initial state”. Otherwise known as the “interlanguage initial state”, the term received increased attention in the 1990s by Schwartz and Sprouse (1994) and Schwartz

and Eubank (1996). According to White (2003: 58), “The term initial state is variously used to mean the kind of unconscious linguistic knowledge that the L2 learner starts out with in advance of the L2 input/or to refer to characteristics of the earliest grammar”. It is important to note that the term was used to refer to the learner’s grammar *per se*, and as such, provoked research investigating the role of UG in L2 acquisition.

Functionalist thinking asks the question differently. UG is not assumed, and functionalists seek, rather, to understand processes of sound-meaning-function mappings in language acquisition. The “initial state” is therefore viewed as the learner’s linguistic knowledge and cognitive capacities *before* building a new language system. In other words, from a functionalist perspective, the L2/L3 initial state is the state of the learner’s mind with its prior linguistic knowledge and developed cognitive abilities that are available for use by the learner at the moment of first contact with the novel language. Given this definition, the question becomes: What is a learner capable of perceiving, comprehending, and producing in a novel TL at first exposure? VILLA results of tasks conducted at first exposure to TL Polish address this question directly.

While we predicted that learners would rely on their linguistic knowledge to accomplish tasks at first exposure to Polish, we also expected to observe learners using cues that were independent of prior linguistic knowledge when performing these tasks. Results of the Phoneme Discrimination task show some capacity to discriminate phonemes; however, they also suggest that learners were not able to form novel phonemic categories initially or even after 10.5 hours of exposure. An L1 effect was particularly robust in these data as evidenced by the support these findings give to Best’s (1995) Single-Category Assimilation: in the French native speaker data, the TL Polish contrast of two phonemic categories was assimilated to one category attested in L1 French. The finding that L2/L3 learners make use of their initial L1 sound system when processing a novel TL is not surprising; after all, phonemes are the most fundamental units of spoken language, and as discussed in Chapter 1, remarkable phoneme discrimination capabilities have been observed in very young infants.

The Word Recognition results revealed that all L1 groups were able to extract some median-positioned words from the speech stream at first exposure (before the onset of the Polish course). Although transparent words showed the highest success rate, some opaque and even absent (from the input) words were recognized. These results are in line with Shoemaker and Rast’s (2013) findings that learners use prosodic cues to identify word boundaries. These cues appear to be useful even in the absence of meaning.

Our predictions were borne out in these data in that learners showed some capacity to discriminate phonemes and extract words from the unfamiliar speech stream. The more interesting question, however, is how they managed to do this.

What helped them break into the new speech stream? In some cases it was access to meaning that helped (e.g. transparent items in the Word Recognition task), as predicted by emergentists with their emphasis on the importance of form-meaning mapping and by VanPatten (1996) who claims that meaning precedes form in input processing. In other cases, meaning was irrelevant. For instance, prosodic cues, which may or may not be L1 related, seem to have helped, in much the same way that words at the periphery of an utterance were recognized more readily than those in medial position in Shoemaker and Rast's (2013) results.

In sum, the picture of the L2/L3 initial state is becoming clearer. At least some L1 properties are, without a doubt, intact and accessed at first exposure and during initial TL input processing. But this is by no means the end of the story. Other factors are also responsible for this initial processing; future research will need to continue to investigate these factors to provide a clearer description of the L2/L3 initial state.⁷⁹

RQ2. Overall exposure to Polish input – To what extent do learners' abilities develop over time (at various time intervals from first exposure to 14 hours of exposure)?

We predicted that learners would improve in their ability to perceive, comprehend and produce in Polish over the 14 hours of Polish instruction, but that this improvement would be constrained by factors under investigation in VILLA and elsewhere, such as L1 influence, TL input properties, and individual differences. This prediction was generally borne out in that participants were found to make rapid progress in all linguistic domains. Some exceptions were found, however. For instance, the German children were not only less successful than the German adults on the Grammaticality Judgment (case) and Oral Question and Answer tasks, but they also failed to show improvement between the two testing times. The German adults improved in oral production, but not in judging the grammaticality of sentences (Hinz et al. 2012). As noted in Hinz et al. (2013), this lack of improvement on the part of the adults may be due to their successful judgments as of the first testing time (overall accuracy score was 81%). Hinz et al. (2012) speculate that the children may have been less successful than the adults on these tasks because their processing resources may have been used up for lexical acquisition. This explanation is supported by the finding that children depended more on transparency for production than did the adults, suggesting that a search for meaning was particularly important for the children. The adults, on the other hand, appeared to be sensitive to the nominal morphology present in target items regardless of their ability to comprehend the lexical items in question.

⁷⁹ The Lexical Decision data are currently being analyzed (van Bergen, Dijkstra & Hilberink-Schulpen, in progress). This task was also administered at first exposure, and results will therefore contribute to the discussion about the L2/L3 initial state.

RQ3. L1 effect - What is the role of the source language in these processes of perceiving, comprehending and producing at first exposure and within the first 14 hours?

In RQ1, we predicted that learners in the VILLA project would make use of their L1 at first exposure, but we were unsure about how long this L1 effect would remain significant and under what conditions.

The VILLA results confirm, indeed, a powerful role for a learner's native language in the early development of a new language system and, in this regard, are in line with full transfer hypotheses. Interestingly though, this L1 effect is not always observed and may suggest that full transfer hypotheses fail to provide a complete explanation of when and how the L1 helps or hinders L2/L3 acquisition. For example, the German native speaker adults performed better on the Grammaticality Judgment (case) task than the French native speaker group; however, this same group of German native speakers did not show an advantage over the French group in production (Hinz et al. 2013). This finding corroborates the BV hypothesis that, in production, learners favor pragmatic and discourse strategies over L1-based strategies. As mentioned earlier, the "learner varieties" hypotheses are based on research of untutored adults, so it is possible that use of L1 may be more visible in data collected in an institutional setting than in a natural setting. Regardless of the level of explicitness of the language instruction (meaning-based or form-based), it may well be that learners constructing a new language system focus on and make use of properties of their L1 when the input is structured in such a way to enable them to do so, as is the case in instructed SLA. In an untutored environment, however, the input is not structured, so the learner must focus on communication to understand and be understood (Bremer et al. 1996). What is interesting, nonetheless, is that L1 effects were not prominent in the production data of the VILLA tutored learners reported here.

RQ4. Role of the TL input - What is the role of the linguistic input in these processes of perceiving, comprehending and producing at first exposure and within the first 14 hours? (e.g. frequency and lexical transparency of items and features in the input)?

Although we expected to observe a robust effect of transparency in most Polish tasks, we also expected some nuances in these effects and interactions with frequency. Several analyses conducted to date have found that lexical transparency and frequency play different roles in learners' acquisition processes depending on the L1 and/or the task (Hinz et al. 2013; Starren et al. 2013).

Hinz et al. (2013) investigated the effects of both transparency and frequency on learners' language development. Results show complex interactions between these variables in data collected from the Grammaticality Judgment (case) and the Oral Question-Answer task of the French and German groups. Frequency

clearly helped both groups in the oral task, while no effect of frequency was found in the Grammaticality Judgment task for either group. An unexpected finding in the oral production task was that learners produced the target items with the appropriate morphological marker more often when the target stem was opaque relative to the learner's L1 (i.e. non-cognate) than when the target stem was transparent (i.e. cognate). It appears that comprehending the word may have interfered with the processing of form. This is an interesting finding in light of VanPatten's (1996) model of Input Processing in which he claims that learners process meaning before form. VanPatten's assumption is that access to meaning helps process form (see also VanPatten 2014); however, this may not always be the case, as seen in the oral production results.

As mentioned above, frequency is considered an essential construct in the "usage-based" account of syntactic acquisition (Bybee 2006, 2010). Although results show some effects of frequency, these results are inconsistent across different tasks. Some tasks showed significant frequency effects, whereas others did not (e.g. receptive versus production tasks). The VILLA data analysed thus far underline the importance of continued research in this domain. Further analyses need to take into account both token and type frequency, the criteria used to measure frequency, and the specific task performed by the learners (e.g. judgment vs. production). In sum, in order to comment more fully on the role of frequency and transparency at the early stages of acquisition, more in-depth analyses of the data are required.

The VILLA project also seeks more precision about the learners' analysis of the input in communication. As mentioned in the discussion of results of the Route Directions task (Rast et al. 2015; Watorek et al. 2016), L1 properties and various cognitive factors may condition the way learners go about searching the TL input for the appropriate means to express what it is they wish to say. Future analyses of the VILLA learners' productions in the classroom as compared to the Polish input are expected to shed light on these questions.

Questions related to selected project teams and participant groups

RQ5. *Effect of different input conditions* - What are the effects of different types of presentation of similar TL properties, i.e. input that is more or less focused on structural properties of the language?

We predicted that some focus on structural properties of the input would favor some aspects of language acquisition more than others. The differences in input conditions were based on morpho-syntactic properties rather than phonemic/phonological. Thus, it was not surprising to find no effect of input condition, namely the difference in performance between the MB and FB groups in the L1 French phoneme discrimination data nor in the L1 French, Dutch, German or Italian word recognition data.

Only a few other studies within the VILLA project have investigated the effect of input condition so far. Generally speaking, the data analysed on receptive processing of morpho-syntactic structures provide support for focus-on-form models, which claim that focusing learners' attention on form can aid acquisition (see Doughty & Williams 1998 and Chapter 4 of this document for a more detailed discussion). We have yet to see whether this effect is maintained in the production data. More analyses need to be conducted before drawing conclusions about the effect of these two input conditions and their relation to pedagogical efficiency.

RQ6. Age effect – How do children and adults compare with respect to extracting information from the input and using it.

As this is not the focus of my work, I will address this question very briefly. As a reminder, the only group of children participants was in Germany and only a portion of the data has been analysed. The project did not put forth a prediction per se with respect to age-related differences. It sought, rather, to investigate a prominent assumption, based on the Critical Period Hypothesis (Lenneberg 1967), that children outperform adults in foreign language acquisition, learning better and perhaps even faster than adults.

Results from the Grammaticality Judgment (case) task and the Oral Question-Answer task do not support this assumption. The German adult learners outperformed the children in both tasks. Their means of extracting information from the input and using it, however, differed in interesting ways. Children, for instance, made use of lexical transparency more than adults in the production task, whereas the contrary was found for the judgment task. In addition, frequency helped the adults in production, but no other significant effects of frequency were found for either group (Hinz et al. 2012).

Dimroth (submitted) reported on VILLA production data from Italian and German MB adults participants and the German children, collected using the Finite Story task after 14 hours of Polish exposure. She found that child productions contained less lexical diversity than the productions of both adult groups. The children did not use creative constructions, whereas the adults did (e.g. pronouns in the determiner function, support verbs). Some adults showed attempts at developing an inflectional system that goes beyond the BV, whereas the children did not. With respect to information structure, the adults used more zero anaphora than overt personal pronouns, and used both much more frequently than the children did.

RQ7. Effect of other L2s – What is the role of the learners' other known languages in the processes of perceiving, comprehending and producing at first exposure and within the first 14 hours?

Few would disagree with the claim that prior knowledge of languages other than the L1 influences, to some extent, the processing and acquisition of additional

languages. The question is, rather, what precisely these influences are. Following the dichotomy of the generativist and emergentist traditions in SLA theory described in Chapter 1, two principal perspectives stand out. The generativist is interested in knowing whether an L3 learner has access to UG in the L3 initial state. The emergentist wishes to know how L3 learners make use of their knowledge (including other L2 knowledge) and cognitive abilities to process the L3 input and learn the L3. With respect to this debate, the VILLA project aligns with the emergentist approach and predicts that learners will use not only their L1, but all linguistic knowledge available to them to accomplish tasks in Polish.

The project has not yet identified a clear role for other L2s in the acquisition of L3 Polish. It is expected that traces of other L2s may be found in the classroom production data, especially in cases where the L2s of a given L1 group differ quite drastically. The L2 effect will also be studied more closely in individual case studies.

RQ8. Individual differences - What is the role of individual variability in the acquisition processes of absolute beginners?

As a reminder, the purpose of collecting data on individual variability in the VILLA project was two-fold: 1) to rule out potential differences between learners, when possible; 2) to observe the variables that may come into play in instructed language acquisition, such as attentional capacity, working memory capacity, personality, metalinguistic awareness, motivation for learning Polish, and learning style.

With regard to the first purpose, these data are meant to support the project's intention to create homogeneous participant groups within and across member countries. This was partly accomplished by selecting university students of approximately the same age in disciplines other than linguistics, philology and psychology and who had not studied Polish or another Slavic language before the onset of the project. The VILLA battery of individual differences tests was therefore intended to rule out major differences that could be found between groups. The second purpose includes the qualitative study of the performance of individual learners relative to specific psychometrics, namely in cases where learners or a small group of learners show a particularly strong or weak performance on a Polish task.

The scoring of these tests is a monumental task and requires intensive collaboration between countries. In cases where different scoring tools exist, project members from each country met to decide collectively on the most appropriate scoring methods. Some tests require that scores be converted for interpretation. Here too, project members work together closely to ensure the reliability of the scoring process.

The data scoring process is still in progress and scores are being carefully verified for reliability. Final analyses will only be conducted on these data once

all test scores have been verified and are recorded in the large VILLA individual differences spreadsheet. These are “static” data that will not be modified, and researchers interested in investigating the role of specific variables on learner performance in Polish or during classroom interaction will have access to the relevant data in the spreadsheet. The data will be used to run not only analyses on the overall homogeneity of the participant groups but also for making comparisons between groups and their performance on Polish tasks.

To date, only preliminary analyses have been conducted on these data. For instance, Hilton (2016) and Hilton, Rast and Starren (2015) ran exploratory statistics of selected data across groups, which revealed that, generally speaking, the VILLA learners were fairly homogeneous across countries. Some significant differences were found, however, and these will be investigated in detail in future studies in order to observe what type of effect, if any, these differences has on learner performance. Hilton (2016) emphasized the importance of examining other factors that may be responsible for these differences. She also highlighted the “precious information on links between classroom behavior and the variables measured (attentional capacity, motivation, intelligence, metalinguistic skill, learning style)”. Analyses of the latter type will be particularly useful for research focused on the language acquisition and teaching interface.

The project will explore between-group differences, as well as correlations between scores on the measures of individual difference and results on the Polish tasks. Included in these analyses are the outlier data, which will contribute to our understanding of the language development of learners with particularly high or low performance on measures of TL knowledge and performance. In establishing this dataset, the VILLA project contributes to the growing area of individual differences in language acquisition within the field of SLA (Dewaele 2009; Dörnyei 2005; Roberts & Meyer 2012; Robinson 2002).

3.7 Conclusion

First analyses of the VILLA data provide new insights into the initial processing of foreign language learners. Let us return to the first research question addressed in the VILLA project: *What is the L2/L3 initial state?* If one postulates a UG, then full transfer of a UG-instantiated L1 for a new morphosyntactic system has not been ruled out by the first results of the VILLA project. VILLA findings thus far, however, do support the LV approach to thinking about L1 influence. The question is posed differently in the LV framework, which assumes that all of a learner’s linguistic knowledge may become available for use by the learner. The LV approach goes beyond the use of L1 knowledge and investigates other linguistic and cognitive processes that lead to the appropriation of a new language. Some of these processes have been observable in the VILLA data, and with further data analysis, will certainly become clearer. The VILLA project has

also collected data to investigate the role of other background languages in the acquisition of a novel TL. Continued analyses of these data will provide more precise insights into how specific linguistic knowledge, not only L1 knowledge, becomes available for use in the language learning process.

Given that the VILLA data provide information about the TL Polish input the learners received as well as the initial knowledge they used to process the novel Polish input, the VILLA data allow for a more precise description of the elementary organization of learner varieties than the data obtained by the ESF study (Perdue 1993), on which the LV approach is based. In this way, the VILLA database gives us access to what learners do even before they manage to produce utterances that are communicatively efficient and interpretable. Importantly, using aspects of the LV approach makes it possible to observe learners from the very beginning and thus to characterize the functioning of the human mind by means of principles that govern learners' analyses of the TL input at all levels, from phoneme discrimination and word recognition to first productions.

First results certainly confirm a powerful role for not only a learner's native language in the early varieties, but also for cognitive and linguistic processes called on when confronted with TL input. Learners extract information from the foreign speech signal to create sound forms and patterns that can be recognized as belonging to the language being learned. These recognized forms can then be mapped to meaning, processed more easily for grammatical information, and eventually used in early productions. In essence, L1 linguistic knowledge helps these processes in some cases, but what is particularly clear is that the input to the second language learner matters. VILLA results confirm that input is a crucial element in language acquisition from the perception of speech sounds to the productive use of case marking. This is by no means a surprising result for a foreign language teacher, as will be discussed in the following chapter.

Chapter 4

The Interface Between Language Acquisition Research and Language Teaching

4.1 Introduction

In the tradition of Corder (1967) and in the spirit of the Learner Varieties (LV) perspective, this chapter considers the interface between language acquisition research and language teaching with a special focus on the learner, the point of intersection between these two domains of language study. We consider Klein and Dittmar's (1979) research objectives in light of the isolation that immigrants were experiencing in Western Germany at the time of their study.⁸⁰ They suggested that this social isolation was closely intertwined with linguistic isolation:

It would be foolish, of course, to take this for the only reason, and it would be still more foolish to imagine that their social isolation could be remedied only by improving their language skills. But, on the other hand, it seems evident that a reasonable solution of the social problem is impossible without a solution of the language problem. (77)

The authors proposed two interconnected areas of study:

1. The analysis of the language behavior of foreign workers at different stages of language fluency;
2. The use of this analysis to improve language teaching for foreign workers. (78)

The VILLA project and its precursors follow this line of thinking, while also incorporating new research perspectives, such as the complex and dynamic systems approach that recognizes, as does the LV approach, that learner systems are constantly in flux and language development is a dynamic process. As Williams (2012: 550) notes, "A major advantage of such an approach is that it attempts to break down the division between research and pedagogy, between researchers and teachers, and between experimental rigor and ecological validity". Rast, Dimroth and Watorek (2011: 71) made a similar observation: "Work at the interface between research in language acquisition and pedagogy is particularly essential for the advancement of practices of language teaching, enhancing language curricula, and making informed decisions about language

⁸⁰ Clearly, Klein and Dittmar's objectives remain highly relevant to SLA research today given the recurrent problem of immigrant isolation.

policies affecting foreign language and multilingual education in today's schools". Language acquisition research seeks to understand and describe the underlying processes involved in language development, namely, what the learner does to appropriate a new language, taking into consideration the various domains of linguistic analysis from perception to production. Language pedagogy research, on the other hand, seeks to identify, develop and use (through teaching) the most appropriate and beneficial tools and methods for enhanced and efficient language learning.

One might assume that language acquisition research should logically be the starting point for language pedagogy (Watorek 2008): if you know how a system works then you can develop ways to enhance that system (e.g. we know that our bodies benefit from certain vitamins so we have developed ways to provide our bodies with these vitamins). However, language teaching was long in demand before we even started studying how people learn languages (Hilton 2011a). Language teachers have experimented with methods that are more or less effective (without necessarily knowing why they are more or less effective), and have over time been able to develop effective teaching tools. If we work backwards and look at why some tools are more effective than others, we could certainly learn something about language learning (see Ellis & Shintani 2014, who have begun to do this). In the meantime, however, SLA research is attempting to understand the underlying processes involved in language appropriation – acquisition - learning. This research overlaps with work in other fields, such as psychology and neuroscience, where studies attempt to understand the functioning of the brain for processes such as memory, perception, and recognition, all of which play a role in the perception, comprehension, production, learning and use of language.

So imagine if we combined the knowledge that language pedagogues have gained from their experience in the classroom and the knowledge we now have from SLA research, would we not be able to develop even more efficient tools and methods for language learning than those that exist so far? If so, how might this be done? The combined theoretical and applied objectives of the VILLA project begin this reflection by demonstrating how bringing the two fields together can result in rich databases for language learning, and how analyses of these data (in this case the VILLA project data) can contribute concretely to reflections on how language teachers can optimise classroom time and enhance their students' experience of appropriating a new target language (TL).⁸¹ The questions that

⁸¹ VILLA project members in collaboration with Greta Komur organized a two-day workshop hosted by the Université de Haute-Alsace in Mulhouse, 16-17 June, 2014. We sincerely thank the invited speakers, Peter Griggs, Rosella Biringer, Helen Lallam, Marinette Matthey, and Georges Lüdi, for their insightful reactions to the project's methodology and its preliminary results. Funded by the GDRI-SLAT grant, another workshop of this kind was organized in collaboration with INALCO, *Journée d'étude internationale Acquisition-Didactique 2*. We wish to sincerely thank the invited speakers of this workshop as well: Marina Chini, Cyrille Granget, Martin Howard,

have guided the VILLA project in acquisition are also pertinent for pedagogy, as is evidenced by the fruitful collaborations between VILLA project members, language pedagogues and language teachers (see Rast & Watorek 2014; Watorek, Durand & Rast 2016; Watorek & Rast 2016). This interface between language acquisition research and language pedagogy has recently received increased attention in SLA (e.g. Rast, Dimroth & Watorek 2011; Ellis 2012; Ellis & Shintani 2014; Komur-Thilloy & Trévisiol-Okamura 2011; Loewen 2015; Paprocka-Piotrowska 2008; Rast & Taïeb 2008; Trévisiol-Okamura & Komur-Thilloy 2011; Véronique 2000, 2005); however, systematic studies of this interface at the early stages of foreign language learning are lacking.⁸²

This chapter is a modest introduction to the field of Instructed Second Language Acquisition (ISLA) as distinct from SLA, and to the primary questions and issues specifically addressed in ISLA research. Discussions of the intentions and results of the VILLA project are intertwined into the text where appropriate. Proposals for action in the classroom are also briefly described. The chapter concludes with an overview of the primary research questions raised in Chapter 1 as they relate to language teaching and with reflections as to how answers to these questions might shed light on certain aspects of language teaching and help us move forward in assuring that the language instruction we provide to our students is as effective and efficient as possible.

4.2 Introduction to Instructed Second Language Acquisition

Loewen (2015: 2) defines Instructed Second Language Acquisition (ISLA) as “a theoretically and empirically based field of academic inquiry that aims to understand how the systematic manipulation of the mechanisms of learning and/or the conditions under which they occur enable or facilitate the development and acquisition of a language other than one’s first”. Two of the most pressing questions in ISLA are how language acquisition research can contribute to helping language instructors teach their students most effectively and efficiently, and how we can enhance methods used to teach and learn foreign languages (Loewen 2015; Williams 2012).

The LV approach, rooted in the SLA tradition rather than in ISLA, asks a slightly different question: How do adult learners work on their input in order to develop language? This question is what ultimately links SLA theorizing and empirical

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⁸² Discussions about the link between language learning and teaching are by no means new as highlighted in Chapter 1. The point here is that these discussions go through phases and change with the development of theories of language learning and teaching. Trévisiol (1993), for example, warns about making suggestions to language teachers based on the observation of language learning in untutored learners. Likewise, making assumptions about how language is learned based on classroom data alone is also problematic.

research to the practice of foreign language teaching. Essentially, what can teachers learn from findings about what learners actually do with the input that teachers address to them? Decades ago, Corder (1967) pointed out the importance of this approach when he proposed that learners have a “built-in syllabus” and recommended looking at language from their perspective, including the errors they produce.

Williams (2012) provides a useful overview of classroom research, a context that fits the University of Paris 8 first exposure studies and VILLA quite well. The questions, issues and methodologies are reminiscent of the action research conducted over the past several decades (e.g. Burns 1999; Cicurel 2011; Griggs 2007; Narcy-Combes 2001; Nunan 1992) and confirm that research in the classroom is alive and well. As Williams points out, those doing research in the classroom have generally two objectives: 1) researching language learning processes; 2) researching how instruction can be made more effective and efficient. The VILLA project identified precisely these two goals in its initial grant request proposal:

The project will investigate the very first phases of foreign language acquisition under controlled input conditions. The principal *theoretical* objective of the project is to carry out an empirical study of rigorously prepared and controlled linguistic input that will contribute significantly to current debates in language acquisition research, such as the L2 initial state, the acquisition-teaching interface, L3 acquisition, the age factor, and the effect of different types of exposure to the novel target language on performance. The principal *applied* objective is to contribute to reflections on how *language teachers* can optimize classroom time and enhance their students’ experience of appropriating a new target language, and on how to best assess their students’ language proficiency and development (Dimroth et al. 2010).

Williams assigns the category of “classroom research” specific characteristics, proposing that the purpose of this type of research is educational. In the vast majority of classroom research studies, the primary purpose of the language course is teaching language to the students, and the primary reason for the students’ presence is their intention to learn the language of instruction. Researchers often use the ISLA setting to collect data on language learning and teaching. In the case of VILLA, the scenario is reversed. Learners were recruited and remunerated for their participation in the Polish course, and few students who took the course had intended to study Polish before they heard about this opportunity. It is thus the experimental aspect of VILLA that brought students to the Polish course, not their desire or need to learn Polish. Nevertheless, the purpose of the course was educational in that the objective of the instruction was to teach Polish to the students. From this perspective, the University of Paris 8

first exposure studies and the VILLA project are at once educational and experimental.⁸³

Although the VILLA project is unique in its methodological design, it naturally falls into the category of “classroom research” or “instructed second language acquisition” (ISLA) merely because of its investigation into language learning in an instructed setting. Moreover, many of the research questions posed by the project are similar to those posed in the field of ISLA. Hence, this section provides a brief overview of the issues raised in ISLA and how the VILLA project contributes to specific aspects of these issues:

1. *The effect of Focus on Form, Focus on Forms and Input Enhancement*

The VILLA project addresses this issue through the study of effects of formal variables in the textual enhancement of the form-based (FB) input condition.

2. *Corrective feedback (CF)*

The VILLA instructor’s approach to feedback in the meaning-based (MB) and FB groups addresses the role of different CF types on language development.

3. *Implicit versus explicit teaching/learning*

The VILLA project’s methodology is designed to observe potential differences in learner performance based on input condition as well as other factors; results of the production data, in particular, may have something to say about this distinction.

These questions have been explored from a variety of theoretical frameworks, but the most common framework for the investigation of classroom second language learning, at least in North America, has been the Input, Interaction, Output Approach (Gass 1997; Gass & Mackey 2007; Long 1996). This approach examines the nature of input to learners, learner output, and how interaction can direct attention and lead to modifications of both input and output. In Europe, the interactionist and conversationalist approaches (e.g. Bange 1992; Pekarek 1996; Matthey 1996; Pallotti & Wagner 2011; Py 1989) address these questions to a certain extent, but generally with a more socio-cognitive or sociolinguistic dimension.

Most of the questions raised by Williams (2012) are compatible with the VILLA project and with most SLA investigations interested in input processing. The “instructed” aspect is, in some respects, a requirement for studies of input processing in the initial stages of L2/L3 acquisition in that the setting allows for

⁸³ In the input studies conducted at the University of Paris 8 prior to the VILLA project, the scenario was similar. Students were not remunerated for their participation per se, but they did receive credit through the self-evaluation course in which they were enrolled. Prior studies recruited students who were studying to become language teachers and needed to fulfill the requirement of studying an unfamiliar foreign language. This was not the case in the VILLA project.

full documentation of the input.⁸⁴ What follows are brief descriptions of how the VILLA database could potentially contribute to questions raised in ISLA, more specifically by Williams (2012: 541-542):

1. *“What do teachers do and say?” and “How do they respond to learners?”*

An interest in knowing what the teacher does and says is at the heart of the VILLA project and was the primary reason for audio- and video-taping the VILLA instructor throughout the Polish course, essentially capturing the instructor’s input.

2. *“How do learners respond to the teacher?” and “How do they respond to one another?”*

In the VILLA project, all learners’ productions, including their responses to the teacher and their interactions with peers, are fully recorded and documented.

3. *“What are the patterns of interaction in the classroom?”*

All interaction is recorded in both audio and video form in the VILLA project, so this can be observed.

4. *“How does the language of instructed learners change in the short-term and long-term?”*

Learners in the VILLA project were tested regularly on Polish tasks, so their progress in Polish can be observed; the limitation, however, is that the data collection only documents the first 14 hours of exposure to Polish. With respect to “change”, the project asks several additional questions: What does the “change” look like? How does the input affect this change? Or rather, what is in the input and what is it about how learners work on the input that affects change? These are questions that Williams returns to later and one that other researchers, namely those researching Processing Instruction (VanPatten 1996), also ask.

5. *“How does what happens in the classroom relate to learners’ lives outside of the classroom?” (Williams 2012: 542).*

The VILLA project does not address this question.

Williams also raises an important issue about “learning” in these studies:

Many studies have not made the leap to actual learning; rather, they focus on how learning opportunities are created and structured. In some studies, however, there is an attempt to match variables to outcomes: What kind of feedback is most likely to lead to a change in learner output? Under what circumstances do learners notice or use explicit information

⁸⁴ Members of the VILLA project have discussed how we might conduct a first exposure study with full control of the input in an untutored setting. Indeed, designing such a study proves to be an interesting challenge.

about language form or use? Where claims have been made about learning, they have tended to be about immediate or short-term change, rather than long-term gains in proficiency. (543)

The focus on short-term rather than long-term change is a drawback of the VILLA project as well, with the data collection period being limited to only 14 hours. Despite this drawback, however, results of the project contribute to our understanding of the initial changes, and the project does make the leap to actual learning through its methodological design, comparing the input with performance. Why do many studies not make this leap? Clearly one needs to know what the input looks like to be able to say anything about the effects of it, but as mentioned earlier, documenting the input is not a simple task. Once the obstacle is overcome, however, the important question becomes, “What kind of feedback (or type of input) is most likely to lead to a change in learner output?”

The VILLA project is unique in that it took the form of a classroom research study conducted within a functionalist approach to SLA. However as mentioned above, the Polish classrooms that were created came to fruition not out of a need for language learning, but rather, as a result of an experimental study of language learning in which the classroom served as an essential tool, one where language input could be controlled and documented. Furthermore, the project’s originality lies in its theoretical framework in that it was designed within the LV approach, which assumes an important role for the TL input and, as is the case of ISLA, assumes that instruction can be beneficial to language learning (Doughty 1991; de Graaff & Housen 2009; Norris & Ortega 2000). The VILLA project did not use a typical input treatment design that examines the effect of a specific treatment on performance. Rather, it used a design in which all of the input was recorded and documented for use in investigating not only the effect of input treatments when they occurred, but also the effect of specific input properties on language development over time. The essence of the LV approach is that learners search the input for form-function mappings needed for successful communication. For acquisition to occur, the learner must “take in” certain elements of the input and analyze them, making use of all resources available (e.g. the L1, other L2s, linguistic and cognitive abilities, universal principles) to identify form-function relations in the input/intake. The level of transparency of these relations is, of course, dependent on the context in which this input appears (Bremer et al. 1996).

It is not surprising, therefore, that the vast majority of research from a LV perspective has focused on oral production in order to observe how learners go about discovering these form-function relations in the input and appropriate them into their learner varieties. Perdue (2002), for instance, proposes a two-computational system in the appropriation of a grammar: 1) combining meaningful units to construct well-formed utterances (word order, subject-verb agreement, etc.); 2) using these well-formed utterances in appropriate contexts.

As such, the proposal within the functionalist school remains production-oriented. The study of the early stages of acquisition, however, requires research that moves beyond the production of utterances and seeks to understand what determines this production, what lies at the base of this production, and what fundamental processes prepare for and interact in this production. The challenge of the VILLA project and its precursors was therefore to propose a methodology in which the input could be controlled in order to observe how learners begin to break into this new stream of sounds and create form-function correspondences.

Following Saussure (1916/1995), who established a clear notion of form-meaning mappings (the signifier and the signified), there appears to be consensus in the literature that form-meaning mappings are a requirement for learning language (Bates & MacWhinney 1987; Carroll 2001; Ellis 2008; VanPatten 1996). It is only with a complete control of the input that we can observe this process. In doing so in a language classroom, we can also observe the important role that the language teacher, the person who provides the input after all, plays in the process of a learner's appropriation of the new language.

4.3 TL input, knowledge and the classroom

This section returns to the focus of this document, the processing of TL input, assuming that all instruction is input in one form or another. We return to the central question: "How do adult learners work on their input in order to develop a new language system?" In this section we address this question in terms of the connection between SLA theorizing, language data collection (collecting and looking at the input and what learners do with it) and foreign language teaching (what teachers can learn from what learners actually do with the classroom input).

4.3.1 The implicit/explicit distinction: knowledge, learning and teaching

We established earlier that everyone agrees that the goal of language instruction is educational, which implies an intention on the part of the teacher to help students build knowledge. Teachers therefore need to know what type of TL knowledge is important and how they can best help their students to build this knowledge. Loewen (2015: 15) asks the important question: "If the goal of instruction is a specific type of L2 knowledge, what can SLA theory and research tell us about the best ways to achieve these goals?"

Education also implies the participation of students. In the case of foreign language instruction, some students will come to the class with an intention to learn (the case of most adults), while others less so (e.g. younger students in required language courses). Whatever the case may be students come with knowledge and systems in place. This prior knowledge, including L1 knowledge,

needs to be investigated alongside the “specific type of L2 knowledge” to be taught.

In his introduction to an overview of implicit and explicit knowledge about language, N. Ellis (2007: 119) summarizes what the field of neuroscience has indicated we know about this distinction:

[...] that implicit and explicit learning are distinct processes, that humans have separate implicit and explicit memory systems, that there are different types of knowledge of and about language, that these are stored in different areas of the brain, and that different educational experiences generate different types of knowledge.

This account is quite straightforward and appears to serve as a starting point for most SLA and ISLA researchers working on the question of implicit and explicit knowledge, learning and teaching. The three areas, tightly intertwined with one another, have been investigated in great length over the past several decades.

4.3.1.1 Implicit and explicit knowledge

Building on R. Ellis' (2005) characterizations of knowledge, Lichtman (2013: 94) defines implicit language knowledge as “knowledge that is accessible without awareness, in time-pressured situations, when focus is on meaning rather than form and without the use of metalanguage”. Explicit language knowledge, on the other hand, “is something the learner is consciously aware of, is only available in non-time-pressured situations, requires a focus on form, and can be verbalized using metalanguage”. Implicit knowledge is often equated to procedural knowledge, as explicit knowledge is to declarative knowledge; however, this comparison is not as straightforward as one might think (Hilton 2009). These two types of knowledge are closely linked to learning and teaching in that assumptions are made about what types of tasks can create opportunities for implicit or explicit learning that in turn can potentially result in implicit or explicit knowledge (see Leung & Williams 2014 for a useful discussion).

4.3.1.2 Implicit and explicit learning

Andringa and Rebuschat (2015) provide a thorough up-to-date reflection on the issue of implicit versus explicit language learning and argue for the importance of continuing research in this domain. They identify three major questions that need to be addressed in SLA theory: 1) the role of awareness in L2 acquisition and whether learning can occur without awareness; 2) the process of measuring awareness; 3) the interface between the two types of knowledge, that is, whether explicit knowledge can foster the development of implicit TL knowledge and vice versa.

Recent definitions have been proposed for implicit and explicit language learning. Andringa and Rebuschat return to Hulstijn (2005), who carefully defined a number of notions related to the implicit/explicit distinction in SLA,

while also pointing out that the most controversial distinction is between implicit and explicit *learning* because one's view on these definitions is closely linked to one's theoretical framework.

Interestingly, it is precisely in thinking about these definitions that we are reminded of the discussion in Chapter 1 about the nature of a learner's knowledge and linguistic system, and the importance of understanding how learners process the linguistic input to which they are exposed. As Andringa and Rebuschat (2015: 187) rightly point out, "For both implicit and explicit learning, it is still difficult to define the constructs more carefully in terms of the *how*". Their question highlights the importance of research being conducted on input processing: "If learning is input processing, then what are the exact processes involved?" (187). Processing instruction (VanPatten & Cadierno 1993; VanPatten 2015), for instance, guides learners in their input processing in ways that are claimed to accelerate the TL acquisition process and are not necessarily conscious.

If we look at the research on this question from the emergentist perspective, we find relevant work in the statistical learning paradigm. As described in Chapter 1, studies conducted within this paradigm show that learners are sensitive to distributional properties of the input. It follows that statistical learning is the process of accumulating knowledge based on these properties. Generally this process is understood to be implicit in the sense that attention to form and/or awareness of form are not required for this statistical processing to occur. However, as Andringa and Rebuschat (2015: 188) rightly inquire, "Could the same statistically driven input processing mechanisms lie at the heart of both implicit and explicit learning, the only difference being the level of awareness at which implicit and explicit learning operate?"

Explicit learning is usually considered the learning that happens as we think and talk about language, including the use of metalanguage, translation to and from the learner's other languages, and conscious practice and rehearsal of language forms and structures. It is important to note, however, as Andringa and Rebuschat do, that, "the ultimate goal of explicit learning is not simply knowledge of concepts and rules" (189).

In essence, regardless of the theoretical framework, the essential questions remain: To what extent is implicit learning responsible for TL acquisition? To what extent can input processing and statistical learning processes be influenced by explicit instruction? Can features of UG be influenced by instruction, and does metalinguistic information and use of the learner's L1 affect any of these processes?

The usefulness of metalanguage in the classroom continues to be debated within the implicit/explicit learning literature. Such tasks are believed to help learners integrate forms and meaning and create metalinguistic awareness (e.g. Cicurel

1985; Griggs 2002). However, the question of whether metalinguistic awareness increases learners' noticing capacity, and as such, promotes successful intake processing and ultimately language development remains under investigation (see Godfroid, Boers & Housen, 2013; Godfroid & Uggen 2013; Housen, Simoens & Godfroid 2016).

Another important debate in language education is the use and role of the L1 in the classroom, often discussed within the realm of explicit learning given that the L1 incites translation, a form of explicit knowledge and learning. Understanding how foreign language learners make use of their L1 knowledge relative to the TL input as received from the instructor and in the course materials will help specialists in language education when deciding how best to incorporate the learners' L1 into course materials and classroom interaction. The discovery of transparency effects, for example, informs our understanding of how learners make use of L1 knowledge.

Although the VILLA project members recognize the relevance of the metalanguage and L1 debates, these variables were not the focus of the study, and hence, neither was included in the instruction (for reasons described in Chapter 3).

4.3.1.3 Implicit and explicit teaching

The question of implicit versus explicit teaching is closely related to the debate about meaning-based and form-based instruction. A plethora of studies has addressed this debate, especially in North America, where the relative effectiveness of Form-Focused Instruction (FFI) and Meaning-Focused Instruction (MFI) (Doughty et Williams 1998) has been debated for decades. To better understand this debate, it is important to analyze the two approaches in some detail.

The MFI approach is based on the assumption that the primary objective of language teaching is to guide learners towards implicit knowledge ("acquisition" in Krashen's 1982, 1985 model) and that the way to do this is through unconscious and incidental learning. This approach also assumes that the best context for learning is when the learner is engaged in the processing and use of the TL for communicative means. Language courses are hence based on communication rather than form. This does not imply, however, that focus on form is completely excluded. To the contrary, the MFI approach proposes two possibilities for learners to work on form while maintaining communication as the primary objective. Long (1988) and Doughty (1991) examine two types of distinct MFI approaches: "focus on forms" (FoFs) and "focus on form" (FoF). In the former approach, the teacher carefully plans the work on forms in advance; in the latter, the teacher makes use of opportunities in the spontaneous productions of the learners to encourage learners to focus on form (Basturkmen, Loewen & Ellis 2002; Doughty & Williams 1998). Meaning and communication

take priority over form in the FoF approach, whereas all are important objectives in the FoFs approach.

The FFI approach began with research conducted in the 1970s on acquisition order, known as the “morpheme order studies” (Dulay & Burt 1973; Larsen-Freeman 1976). Generally speaking, findings did not confirm an effect of FFI on the order of acquisition; however, certain results encouraged further investigation. Pica (1983), for instance, examined the acquisition of grammatical morphemes in English using three groups of learners: 1) an instructed group; 2) a non-instructed group; 3) a mixed group. Results showed that instructed learners were better at producing the plural *-s* on English nouns in obligatory contexts than learners of the non-instructed group. Studies such as Pica’s attempted to respond to the question “Is there an effect of FFI on L2 learning?” According to a meta-analysis conducted by Norris and Ortega (2000), research shows that FFI is beneficial for learning. The notion of FFI, however, is vast, so the more important question becomes, “What is the effect of different types of FFI on learning?” As is the case with the MFI approach, the FFI approach makes the distinction between two sub-approaches to instruction: implicit and explicit. In the implicit approach, teaching focuses on meaning and communication with TL forms presented in context. Meta-language is excluded. The explicit approach, on the other hand, makes use of meta-language in the classroom and learners are asked to pay attention to and practice forms that are selected in advance.

Given the descriptions above, the overlap between the FFI-implicit approach and the MFI-FoF approach becomes quite obvious. There is a difference, nonetheless, and it lies in the “incidental” factor. For MFI-FoF, communication is the priority and forms are only taught if they come up spontaneously. In both types of FFI, form is essential and planned. No type of MFI resembles the FFI-explicit approach, given that the latter approach implies the inclusion of metalanguage, which is never the case in the MFI approach. It has also been argued that learners require opportunities for both types of instruction, focus on meaning and focus on form; without one or the other, instruction is less beneficial.

With this literature background, we can now return to definitions of implicit and explicit teaching. In general, the ISLA literature continues to use DeKeyser’s (1995) definition of explicit instruction, as does R. Ellis (2012: 275) “some sort of rule being thought about during the learning process”. Implicit instruction, on the other hand, “is directed at enabling learners to infer rules without awareness” (R. Ellis 2012: 275). The latter does not imply, however, that implicit instruction is devoid of attempts to induce learners to attend to form. As noted by de Graaff and Housen (2009) in their analysis of implicit and explicit FFI, the key difference between the two types of instruction lies in whether the instruction “directs” or “attracts” attention to form. Explicit instruction “directs” in that it incites learners to attend to form and to create conscious mental representations of these forms, with or without the use of metalanguage. Implicit

instruction, on the other hand, aims to “attract” learners’ attention to exemplars of linguistic forms as they occur in communicative input but does not seek to develop any awareness or understanding of the “rules” that describe these forms.⁸⁵

In terms of the distinction between implicit and explicit instruction, R. Ellis (2005) shows that different types of tasks tap implicit and explicit knowledge separately, confirming that this distinction needs to be better understood. He found that learners tend to perform better on explicit tasks than implicit ones and to master structures more quickly and accurately under explicit than implicit instructional conditions. These results align with the findings of two widely cited meta-analyses (Norris & Ortega 2000; Spada & Tomita 2010), which reveal that, generally speaking, explicit treatments result in better learner performance than implicit treatments.⁸⁶

It is also worth mentioning here an extensive study of students in intensive ESL programs (Lightbown & Spada 1990). The authors explored the effects of FFI and CF in communicative language teaching in a study of 100 native speakers of French, aged 10-12, in four beginning intensive ESL classes, each with a different instructor. Learner performance on several English grammatical structures was analyzed with respect to differences in how the teachers incorporated form-focused instruction. The authors concluded that the most beneficial type of instruction for developing accuracy, fluency and overall communicative skills is likely one that is primarily meaning-based but that also guides learners through timely form-focused activities and correction in a meaningful context. In the same vein, Kumaravadivelu (2006/2009: 64) concludes his review of the findings of several studies with the statement: “bringing linguistic properties to prominence within the purview of a meaning-focused instructional strategy may change the way language data are recognized by the learner as potential language input, thus favorably shaping intake factors and intake processes” (64).⁸⁷

Although many questions still remain, a general trend has appeared in the literature regarding the role of implicitness and explicitness in foreign language teaching. As far as instruction is concerned, research findings indicate that the

⁸⁵ Originally the VILLA project referred to its MB condition as “Implicit” or “Basic”, and its FB condition as “Explicit”. This terminology was problematic partly because the FB instruction was designed to “attract” rather than “direct”, and the MB was intended to do neither. The project found no extant categories in the ISLA or SLA literature that precisely described these two conditions.

⁸⁶ Note that these “tasks” are linked to input “treatments”. In the VILLA project, we set out to examine all the input to see if differences could be observed from essentially two different types of what VILLA members, for the most part, considered to be “implicit” instruction in that metalanguage and explanations were absent from the instruction, the closest we could get to a natural setting and therefore to natural language acquisition processes.

⁸⁷ VanPatten and Cadierno (1993) were some of the first to put this notion of “shaping intake factors” to the test in a classroom setting.

most efficient and effective teaching is one that involves focus on meaning within contextualized interaction and communication while also providing some guidance about TL structures and properties. This is precisely the approach that the VILLA project selected for its Polish instruction. In fact, as mentioned in Chapter 3, both input conditions were communication-based with a focus on meaning, and both provided some information about TL structure; the difference lies in the extent to which information about the TL structures was provided and in the way in which these structures were presented.

4.3.2 The VILLA project: implicit and explicit instruction

Type of instruction: MB versus FB

The choice of type of instruction for the VILLA project was influenced by both research conducted on the efficiency of language instruction and research conducted on language acquisition in an untutored setting. The results of the ESF project and subsequent studies of learner varieties have convincingly shown that adults are quite efficient in their ability to learn to communicate in a new language when exposed to the TL without instruction (Perdue 1993; Dimroth & Starren 2003; Hendriks 2005). Other research in the interactionist framework confirms the important role of interaction and negotiation in L2 acquisition, such as Pekarek Doehler (2000), who argues that interaction should be understood as *the* essential factor that structures the developmental process.

The VILLA project was built on the assumption, based on consensus in SLA and ISLA literature that input is necessary for acquisition, that classroom instruction can benefit language learning (Long 1983; Doughty 1991) and that some “attraction” structure is effective, as argued above. It follows that a teaching method based on communication with some manipulation of structure is justified. Less clear, however, are questions, such as: What type of structural focus is most efficient? Can focus on structural properties have negative consequences? And finally, at what proficiency level, if any, is an approach integrating form perhaps more beneficial than one that excludes this focus on form?

While results of prior studies in SLA and ISLA and the interest in building on the ESF database guided the VILLA project towards a teaching approach based on communication, the remaining questions above inspired the project to create two types of input conditions: both were designed to provide a communication-based instructional environment, but one was less focused on form (meaning-based, MB) and one more focused on form (form-based, FB) (see Chapter 3 for more details). With the type of fine-tuned analyses conducted in the VILLA project, we expect to observe whether one input type incites better performance on specific tasks than the other.

Corrective Feedback

The literature on CF, both oral and written, is vast and complex, and, as Loewen (2012) notes, remains inconclusive: “The effectiveness of negative feedback for L2 learning is contentious, despite its frequent occurrence in the L2 classroom” (26). He also points out that recent meta-analyses have found positive effects for CF (Li 2010; Mackey & Goo 2007; Russell & Spada 2006), inspiring a question at a deeper level: “What characteristics of feedback influence its effectiveness?” (Loewen 2012: 27). Replies to this question, an essential one for the VILLA project as well, will likely be found in the VILLA learner production data. Ellis and Shintani (2014) have already begun to delve into detail about when errors should be corrected, which ones, how and by whom.

When referring to CF, the researcher generally examines the feedback and the learner’s response to the feedback, that is, what the teacher does, what the learner is expected to do, and what the learner actually does (usually referred to as “uptake”). In the case of the teacher, the term CF is used when the teacher provides information to the learner, implicitly or explicitly, that an utterance is not entirely correct. In this case, the teacher is making a feedback “move”. Williams (2012) identifies two broad categories of CF, those that provide positive evidence and/or implicit negative evidence (e.g. recasts or reformulations) and those that provide explicit negative evidence (e.g. prompts or elicitations). Loewen (2015) reminds us that the theoretical justification for using negative evidence is the assumption that drawing learners’ attention to incorrect forms is useful for learning (as noted above in the sections on implicit and explicit knowledge and learning). Such an assumption is defended by proponents of Schmidt’s (1990) work, in which he claims that, “intake is that part of the input that the learner notices” (139). From a UG-based theoretical perspective, although negative evidence could lead to explicit knowledge, explicit knowledge does not convert to implicit knowledge. Given that UG is a theory of implicit linguistic knowledge, it follows that negative evidence will not lead to acquisition. In other words, explicit correction is believed not to contribute to acquisition because “acquisition” consists of implicit knowledge only, i.e. features of an innate system (see Paradis 2009 for further discussion). The cognitive-interactionists, on the other hand, view CF as an opportunity to draw learners’ attention to form-meaning mappings that they can subsequently practice in interaction (Ellis & Shintani 2014).

The following are the most common CF strategies, some of which overlap:⁸⁸

explicit correction – The teacher overtly indicates an error and provides the correct form.

⁸⁸ This list is compiled and adapted from Ellis and Shintani (2014), Loewen (2012, 2015), Lyster and Ranta (1997), Lyster & Saito (2010) and Williams (2012).

recasts/reformulations – The teacher implicitly revises the learner’s utterance and may or may not seek an uptake from the learner.

clarification requests – The teacher indicates that a learner’s utterance has not been understood or is ill-formed in some way.

prompts/elicitations – The teacher signals the error by eliciting completion of the utterance or using a question to elicit the correct form. The teacher encourages repair.

repetition – The teacher repeats the learner’s incorrect utterance usually adjusting intonation to highlight the error.

metalinguistic comments – The teacher comments on some aspect of the structure of the learner’s utterance (well-formedness) without necessarily providing the correct form.

Finally, as per Loewen (2012) above, Williams (2012: 545) signals conflicting findings about the relative effectiveness of feedback:

The feedback moves themselves have come under the closest scrutiny, with a focus on the following factors: (1) explicitness of the corrective nature of the move, (2) the length and complexity of the move, and (3) whether the feedback is extensive or intensive, that is, whether just one form (or very few forms) are the focus of feedback or if the teacher simply responds to whatever errors emerge.

In a large-scale exploratory study of 207 German-speaking learners of English, Havranek and Cesnik (2001) and Havranek (2002) investigated the effects of different types of CF. Not surprisingly, in a series of language tests, they found that the role of feedback depends on many factors, including but not limited to the type of error, the type of feedback and the type of learner. Of particular interest was the finding that, although not all CF types were found to be beneficial, the number of times a specific error was corrected showed a positive effect, suggesting a role for frequency in CF. Most importantly, CF was found to be most useful when learners were able to respond and their uptake was successful. This latter finding suggests an important role for some type of explicit instruction and may also suggest that CF can be used to confirm and consolidate knowledge, bringing it to a more stable level of acquisition. Li (2010) also reports benefits of CF in a meta-analysis of 33 studies. Of particular importance is the finding that explicit feedback was found to be more beneficial in the short term and implicit more beneficial in the long term, suggesting that implicit CF contributes to the building of implicit knowledge over time, becoming potentially more durable than the knowledge gained through explicit CF.

The literature on “uptake” moves (or “prise”, Matthey 1996) is also vast and shows the complexity of the acquisition process as well. R. Ellis (2012: 178) describes uptake as “a discourse move where learners respond to information they have received about some linguistic problem they have experienced.” He

categorizes these moves into two groups: “repair” and “needs repair”. Repairs are when the student repeats the feedback, corrects the error, incorporates a repetition of the correct form into a longer utterance, or corrects the feedback given to another student. In the category “needs repair” are acknowledgements where the student replies “yes” or “no”, repetitions of the same error, the production of a new error, an off-target response, a hesitation, or a partial repair (Matthey 1996).

The issue of uptake is complex and will be addressed in the VILLA data once analyses have been conducted on the precise nature of the CF that the Polish instructor used in the classroom and once the transcriptions of learner productions are complete. Following the results of Havranek (2002) and Matthey (1996), which reveal the importance of “uptake” for learning, this phenomenon is of particular interest to the VILLA project and to first exposure studies in general.

Concerning written CF, Rast (accepted) discusses the merits of CF in the form of composition symbols in the development of writing in a foreign language. Analyses conducted within the LV approach, inspired by Corder’s (1967) discussion of the significance of learners’ errors, suggest that the common practice of using “correction symbols” or “codes” in isolation is insufficient for language development. Rast proposes to combine symbol use with a qualitative and interactive approach to signalling structures that contain mechanical errors, especially those that may result in a breakdown of communication. This research was inspired, in part, by the strong input effects observed in the VILLA data, by research supporting the important role of meaning and comprehension in language development, and by the assumption that language learning happens through interaction.

Learner Variability

As mentioned in Chapters 2 and 3, an increasing number of SLA studies are paying attention to the effects of learner variability in language learning. With respect to the explicit and implicit distinction, researchers are focusing, for example, on the question of how individuals might differ with regard to their ability to learn either explicitly or implicitly (Andringa & Rebuschat 2015).

As a reminder, the purpose of collecting data on individual variability in the VILLA project was two-fold: 1) to rule out potential differences between learners, when possible, 2) to observe the effects of differences, if any. As mentioned in Chapter 3, final scoring and preliminary analyses of these data are in progress, and results from a similar perspective to those reported in Rast et al. (2014) based on a VILLA pilot study will soon be forthcoming.

4.4 Proposals for action

Many SLA and ISLA researchers have offered hints at potential teaching agendas that assume a specific role for the teacher in the learning process based on theoretical assumptions. In the cognitive-interactionist paradigm for example (e.g. Gass & Mackey 2007), experiments in the classroom show the benefits of learner output in their language learning. From a different angle, VanPatten (2015) shows how carefully manipulating certain aspects of the input in very specific ways can increase learners' ability to restructure their linguistic systems and hence process (comprehend) the input they receive. Finally, Sharwood Smith (2014) recognizes that teachers are limited in what they can do for learners during language instruction and points to the types of input instructors can "work on" with learners to make for effective teaching-learning conditions. His reasoning is based on the MOGUL model (Sharwood Smith & Truscott 2014) in which the core language system contains modules (e.g. phonological and morpho-syntactic) that are internal to the system and therefore may not be influenced by external input.

This section sets out several concrete proposals for action in the classroom based on findings reported in this document, especially those from the VILLA project and LV research, but also in response to research conducted in generativist and emergentist-based paradigms.

4.4.1 Proposals based on results of Polish tasks in the VILLA project

4.4.1.1 Sounds

As mentioned above, everyone seems to agree that the role of sound-meaning mapping in the process of spoken language learning is an important one and merits our attention. In all spoken languages, combinations of sounds are used to build utterances that carry meaning. In order for meaning to be understood by a learner, the sounds of the language must be heard and connections must be made in the learner's mind. In order for meaning to be communicated, the learner must be able to produce the sounds of the language. It follows that the ability to perceive and produce TL sounds is crucial to language development, and more specifically, to vocabulary learning as a first step.⁸⁹ Neither of these skills is the focus of much foreign language teaching, however, regardless of whether or not they have been designated as an integral part of the curriculum. What might be the reason for this? Huart (2007, 2010) suggests that language teachers feel unprepared to teach the sounds of language, and consequently, might ignore the issue altogether or conduct a sound-based activity at the end of class if time permits, as a sort of complement to the lesson. It is also the case that

⁸⁹ Beacco (2000) emphasizes the importance of vocabulary learning when attempting to access or enter the target culture. This access in turn increases motivation, which has been found to push the acquisition process (Dörnyei 2005). I argue here that learning the TL sound system is a crucial element in this cyclical process.

the communicative approach to language teaching has been the dominant approach in western societies for decades. Its primary tenet is that language learning happens in interaction and in situations that are based on natural language learning environments (simulating child language development). Research from the cognitive-interactionist framework has argued in favor of this approach and has provided evidence to support its claim (Gass 1997; Gass & Mackey 2007). Some researchers working in the UG framework, however, argue that interaction is insufficient, perhaps not even useful for the acquisition of certain types of features (VanPatten 2015). Researchers from various approaches remain noncommittal on questions of pedagogy, generally for two reasons: 1) they opt for prudence assuming that we cannot make recommendations if we do not yet understand the underlying processes involved in language learning; 2) their concern is to understand these underlying processes, not to make recommendations for how one might enhance language learning.

If we consider the importance of sounds in spoken language, it seems reasonable to hypothesize that mastery of the TL sound system will increase a learner's effectiveness in communicating in the language.⁹⁰ This is the assumption in, for example, Huart's (2010) teaching method for spoken English, in which she includes training in stress, rhythm, vowel reduction and neutralization, and the perception and pronunciation of English vowels, consonants and intonation patterns. In a recent study of pronunciation skills in French learners of English, Capliez (2016) demonstrates the usefulness of teaching individual sounds (the segmental level), as well as teaching stress, rhythm and intonation (the suprasegmental level).

Two Polish tasks from the VILLA project, Phoneme Discrimination and Word Recognition, have provided results that address this hypothesis at first exposure. Taken together, results of these tasks indicate that 1) in some L1-TL combinations, learners assimilate two TL phonemes to one L1 phoneme, leading to an inability to discriminate between two distinct phonemes in the language being learned, and 2) transparency aids learners in extracting words from the novel sound stream. Concerning the first point, the difficulty perceiving sounds should logically create problems of comprehension, at least if we understand comprehension as a bottom-up process. For those who view comprehension as a top-down process, one based rather on pragmatic and semantic capacities, the argument is that discrete phonetic and phonological information is not always needed for comprehension, and evidence is provided to support this claim. If we

⁹⁰ This hypothesis is reminiscent of bottom-up approaches to language processing and learning. I do not argue in favor of an exclusively bottom-up approach by any means. Language learning occurs in and through interaction, which involves top-down processes; however, it is becoming more and more clear that effective comprehension and production of the sounds of the TL aid communication, and in turn, successful communication fortifies interaction and acquisition (Havrenek 2002; Trévisiol-Okamura & Marquilló Larruy 2017).

take the middle road, it seems likely that both bottom-up and top-down processes are at work in language processing, as suggested by proponents of interactive models of lexical processing (see Frauenfelder and Tyler, 1987 for an in-depth discussion). Concerning the effect of transparency in the word recognition task, transparent words tend to contain phonemes that are common to the L1 and/or at least one of the background languages of the learner (Carroll 2004; Rast & Dommergues 2003; Rast 2008). Difficulty extracting opaque words could be due, at least partially, to the nature of the unfamiliar novel phonemic categories and combinations to which learners are confronted. In much initial language learning, learners hear sounds they have simply never heard before. Such is the case with all the VILLA learners of Polish.

In what follows, we take a look at the results of these Polish tasks in light of learning and teaching.

According to Shoemaker (2014), in the Phoneme Discrimination task, the VILLA French native speaker groups performed well on pairs of one-syllable non-words made up of C-V structure that differed in voicing, but they did not perform well on pairs distinguished by place of articulation, sibilant consonants in this case. The sibilant-vowel combinations that posed problems for learners contained sibilants that are not attested in French. Would learners have benefitted from training on these combinations?

Although minimal pairs exercises are well known in the English as a Second Language (ESL) literature (e.g. Gilbert's 1984 widely used textbook *Clear Speech*), the tendency has been to overlook them in favor of communicative language activities. This said, a focus on sounds in the classroom is returning to the front lines of language teaching (e.g. Huart 2007, 2010; Rolland 2007). Although VILLA results suggest that exercises like minimal pairs may be useful, more rigorous ear training might be necessary to make the investment of time and energy worthwhile. McGuire (2007), for instance, conducted a pilot study on the perception of Polish sibilants by native speakers of English. As with the VILLA results, he found that participants initially assimilated two Polish phonemes to one English phoneme. With training, however, they improved in their ability to distinguish the two Polish sounds.

Would this type of perception training, and perhaps pronunciation training, have an effect as well on learners' ability to extract words from the speech stream? According to van Bergen, Shoemaker and Rast (2014), frequency and transparency effects were observed in the word recognition task after 7.5 hours of exposure. If learners were explicitly trained in the sounds of Polish, would frequency have an even stronger effect on extraction and would the effect perhaps show up earlier? Would opaque words be more readily extracted?

Research conducted by Rast and Dommergues (2008) on the ability of learners of English to distinguish between American and English accents relative to their

proficiency level of English also contributes to this discussion. In a discrimination task, learners ($n = 55$) listened to words and short sentences (80 stimulus items equally distributed and randomized) and were asked to identify whether the word was spoken by a speaker of “American” English or “English” English. Results revealed that participants with a higher level of English language proficiency scored better than those with a lower level of proficiency. Again, these results suggest that sensitivity to discrete aspects of the sound system helps learners link the sound they hear to what the sound is meant to represent, be it an accent or an utterance that carries meaning.

The fields of SLA and language pedagogy would benefit from continued research in this domain. The effects of training, for instance, could be investigated for its role in helping students grasp vocabulary more quickly (Cook & Singleton 2014; Singleton 1999). Returning to the question of how language acquisition research can contribute to helping teachers teach their students more effectively and efficiently, it may well be that a focus on the sounds of the TL will speed up the language learning process. Findings that suggest an important role for focused work on the sound system of the TL also support current research ventures, such as those investigating language learning through musical training (e.g. Miras 2013).

As noted in Chapters 2 and 3, several first exposure studies have found that learners are capable of segmenting certain aspects of the speech stream quite rapidly. If we know what aspects they can or cannot segment, we may then consider focusing our teaching efforts on those segments that pose problems. For example, transparency has been found to help learners segment the speech stream. This is not surprising, and teachers (and textbooks) already use this “cognate” strategy to help learners understand simple discourse structures and learn new words, a form of lexical bootstrapping. Should teachers make use of these transparent words more regularly? Should teachers make use of a better mix of transparent and opaque words to help learners build their TL lexicon/vocabulary? We also need to consider the flipside of the transparency benefit, namely the parts of the speech stream that learners do not segment. Note that an observation based on sentence repetition data (Rast & Dommergues 2003) suggests that much of the problem may be at the phonemic level, which means that the action proposed for phoneme discrimination may also help for word recognition.

Although a phonemic analysis of the VILLA word recognition data has not yet been conducted, the VILLA database provides project members with the linguistic information needed to examine the Polish opaque words relative to their phonemic distance or similarity to native sounds and to test an effect of phonemic distance on learners’ ability to segment the speech stream. In order to do this, words in the Word Recognition task will be categorized as “close” or

“distant” relative to each of the L1s of the project, using the methodology established by Rast and Dommergues (2003).

The frequency effect is also an important factor to understand. Under certain conditions and in certain tasks, we do not observe an immediate effect. Here too, operationalizing frequency differently, namely analysing “real” frequencies in the input (as in van Bergen, Dijkstra & Hilberink-Schulpen, in progress), including not only the total type/token calculations but also the regularity of use by the instructor over the 10-day period will provide information about how different types of frequency might enhance, more or less, learners’ vocabulary development.

With regard to the hypothesis that mastery of the TL sound system will increase a learner’s effectiveness in communicating in the language, results thus far suggest that greater sensitivity to sound distinctions has an influence on learners’ performance on certain TL tasks. In order to fully test the aspect of the hypothesis that speaks to effectiveness in communicating, analyses across tasks, such as phoneme discrimination, word recognition and production will be necessary. If we find, for example, a correlation between learners’ ability to discriminate Polish sounds, extract words from the Polish speech stream and use Polish effectively in production tasks, this would indicate that instruction in the perception and production of sounds may be beneficial for overall communication in the TL.

4.4.1.2 Sound-meaning-function mapping

Exposure to sounds alone does not lead to language learning. As we all know, we can listen to quite a lot of foreign language without understanding anything. Consider a trip to Thailand where a visitor, unfamiliar with Thai, hears Thai on the radio while riding in taxis, in the hotel while eating meals, and in the streets while walking around. If the visitor hears the Thai language in the environment but does not engage with it, little to no learning of Thai will occur. Some sort of engagement, perhaps motivated by a desire to communicate in or at least understand the foreign language, would lead to a next step, that of trying to make sense of these foreign sounds. In other words, the visitor would begin to engage in a process of sound-meaning (or form-meaning) mapping. To take this a step further, in order to understand and use the language, the visitor would also need to be able to connect the meaning of a cluster of sounds (e.g. a “word”) to the context in which these sounds are produced. For instance, the cluster “also” carries semantic content in English, but this content is not particularly useful unless it is connected to something else that informs the context. This information about context is better known as “function” (Bates & MacWhinney 1981, 1982). Hence, for successful communication to occur, generally accurate form-meaning-function mapping will be necessary.

Based on this assumption about language learning, the VILLA project and prior pilot projects developed the Oral Question-Answer task (Hinz et al. 2013; Rast et al. 2014). Successful completion of the task required learners to comprehend questions in Polish in order to reply with the correct Polish form in which not only meaning but also function is inflectionally marked. The test was designed to investigate whether learners at the initial stages were able to map form, meaning and function, and if so, what helped them do this.

Analyses of the VILLA MB French and German adult learner data (Hinz et al. 2013) revealed that Polish nouns with case marking that were present in the input were better produced than those that were absent by both groups at both test times. An unexpected finding, however, was revealed in the analyses of the transparency effects. Whereas better production of transparent items over opaque ones was expected, the contrary was true. Opaque items were better produced than transparent ones by both the French and German adult learners. This result suggests that learners were more sensitive to the regularity of noun endings on opaque words than transparent words. It is worth noting here that noun endings are in reality simply sounds or combinations of sounds, as pointed out by Carroll (2004). For learners to be able to pronounce the sounds, and especially to produce the desired and/or appropriate sounds, they need to have perceived the sounds in the input and taken them in. It follows that essential questions for language instructors are: What helps this process and how can language teachers make use of their understanding of the process to engage their students in more effective language learning?

Although few analyses have examined the effects of the two VILLA input conditions thus far, first results of receptive tasks lend support for a teaching approach that includes the highlighting of TL structural properties that differ from L1 properties, even at the very initial stages. Of particular interest for future studies is whether analyses on production data will show similar results. Watorek, Rast and Hilton (2011), for example, showed a beneficial effect of some focus on structural properties in the input for early productions. Latos (forthcoming) also found effects (see the following section). As a reminder, the VILLA database includes learners' performance on production tasks and their oral productions during the Polish lessons. The transcription, coding and analyses of the learners' productions will, without a doubt, contribute a new perspective on the elementary stages of linguistic organisation for the advancement of practical considerations and classroom applications.

4.4.1.3 The implicit/explicit distinction

The VILLA project investigated the effect of more or less structured input on learner performance on Polish tasks and in classroom interaction. The few findings that are available at this time indicate some influence of input type. For

instance in the Grammaticality Judgment (case) French native speaker data, although Watorek et al. (2017) found no difference in accuracy scores between the MB and FB groups, they did find a difference in reaction time, with the MB group reacting more rapidly than the FB group. This result suggests that the FB group participants may have paid attention to grammatical structures in a way that the MB participants did not, which is not surprising given that the FB group was in essence “trained” to pay attention to form, especially to word endings. The FB group may have made more use of their explicit declarative knowledge in judging these sentences than did the MB group, which may have obstructed, to a certain extent, automatic processes. More research of this type is needed to see if this difference extends over time.

Processing Instruction (PI) (VanPatten & Cadierno 1993; VanPatten 2015) is worth mentioning here. Although VanPatten (2014) refrains from taking a position on the on-going implicit/explicit debates with respect to input processing, he assumes that language acquisition is predominantly implicit: “A second related issue is that in the end, a good deal of language acquisition is implicit and what is stored in the linguistic system is implicit in nature” (195). He also emphasizes that, “a definition of processing does not require awareness of what is being processed” (196). An important objective of PI is to “forge links between form and meaning” (VanPatten 2015: 93). It does not intend to make language “salient” for the learners, and if language does become salient (i.e. “noticed”) through PI, this is incidental. PI does not attempt to render elements of language salient; rather, it is about form-meaning connections, not about salience or noticing: “To put this in another way, making something salient may or may not force a form-meaning connection; and forcing a form-meaning connection may or may not make something salient” (93). This perspective stems from generativist-based theory and the claim that there are no “rules” to be learned because there are no “rules” in the input to be discovered.

Given the results of the Phoneme Discrimination and Word Recognition tasks mentioned above, one might be tempted to concur with VanPatten that the input is made up of phonological units,⁹¹ not necessarily “rules” in the traditional sense. However, firstly, one should consider what is meant by “rules” from an emergentist and LV perspectives. Rules are patterns or constructions that appear in the input. They may not be psychologically or linguistically real representations of what actually exists in speakers’ minds, as VanPatten (2015: 97) suggests, but patterns can be observed in the ambient input, and research

⁹¹ VanPatten (2015) actually describes the raw data of the input as morpho-phonological units and phonology (including prosody). Given what we know about what learners do at first exposure, I prefer to describe the input as phonemic, phonological and prosodic units (i.e. sounds) as per Carroll (2014). Morpho-phonological or morpho-syntactic representations may be built from these sound units through exposure to the external input, interaction in the TL, and as language develops. This process may or may not be influenced by an innate morpho-syntactic mechanism.

has shown that these patterns can be “learned” (i.e. stored in memory and retrieved) as part of the process of constructing a new linguistic system (e.g. Bybee 2010; Ellis & Wulff 2015; Goldberg 2006; Rast 2008; Tomasello 2003).

This observation brings us back to VILLA data analyses in progress. Latos (forthcoming) conducted an in-depth analysis of the inflectional forms of one Polish lexical item, *ulic-* (‘street’), in the input addressed to the French native speaker MB and FB groups. Her focus was the morphological endings used by the instructor in her productions of *ulic-* and the learners’ productions of all forms of *ulic-* in the Route Direction task. Results from the comparison of the two inputs (MB and FB) revealed that the FB input contained a more varied distribution of endings attached to *ulic-* than the MB input. As a reminder, both input types were communication-based, and as such, meaning was always at the forefront of classroom interactions. The instructor did not use more inflections in the FB input, but she regularly used a wider variety of endings, including nominative, locative, accusative and instrumental. In the MB input, she used all of the above-mentioned forms; however, usage of the nominative form was clearly dominant. Although the MB and FB Polish lessons were designed to teach the same inflections, the fact of focusing on form appears to have influenced the teacher in her actual use of form. It may be that the instructor perceived the nominative form, considered the default form in BV theory, as the easiest form for learners to process. Results of the production task revealed that learners in the FB group used diverse endings more frequently and regularly than did learners in the MB group, suggesting that the FB input “pushed” learners to move outside their comfort zone and experiment with non-default forms. This difference in inputs and learner performance is an important finding; it appears that an approach that focuses on form influences not only the learners’ processing of the input, but also the teacher’s overall input to the learner. Such a finding confirms the importance of carefully describing the input in such a way that it can be compared to certain aspects of learner performance with a view to better understanding how learners convert their input to intake, a language system that subsequently becomes available for use as output.

The VILLA project and much emergentist research attempt to better understand the relationship between the establishment of form-meaning connections and language development. If VILLA results show that a certain focus on formal elements helps learners make these connections, as Latos’ findings seem to suggest, this would argue in favor of a role for explicit teaching in language learning. Whether this teaching leads to implicit or explicit learning and/or knowledge, however, is beyond the purview of the VILLA project. What could be concluded is that explicit teaching appears to benefit certain domains of L2/L3 acquisition.

First exposure results with respect to this question suggest that the type of instruction that carefully combines focus on meaning and form may be the most

effective. Providing excessive focus on form may slow learners down and prevent the automatic processes of language acquisition to take hold, whereas organizing meaningful material in such a way that helps learners process form may favor both automatism and accuracy.

4.5 Discussion

We return to the questions raised in Chapter 1 and again in the following chapters, this time from the perspective of the acquisition-teaching interface.

1. What is the L2/L3 initial state and what is the role of the L1?
2. What is the nature of the linguistic input, and what role does it play in learner language development?
3. What does the input actually look like in empirical studies of L2/L3 acquisition?

1. What is the L2/L3 initial state and what is the role of the L1?

Issues of particular relevance to this chapter on the acquisition-teaching interface stem from questions about implicit versus explicit teaching, learning and knowledge. In this question, a description of the L2/L3 initial state involves describing prior linguistic knowledge and cognitive capacity. Interestingly, some of the same issues appear in our theoretical discussion in Chapter 1 about the nature of language, the initial state and language acquisition. Theories of FLA and SLA differ in their claims about the nature of learning and knowledge, and theories of ISLA contribute to the discussion, in that they also present claims about the nature of teaching and its effect on learning.

As a reminder here, the characterization of “learning” tends to depend on one’s theoretical framework. If we look at the MFI approach to teaching, it posits that explicit teaching leads to implicit knowledge (whether this is through implicit or explicit learning processes is not entirely clear). Until we resolve the debate about the role of innateness in language acquisition, teaching methods will continue to differ due to theoretical divergence.

In fact, we still know little about the precise nature of learning (at least in the case of language learning), with the exception of some studies in neuroscience that inform us of findings, such as the fact that procedural (implicit) and declarative (explicit) knowledge (or rather, memory systems) may be stored in different parts of the brain. This issue of knowledge storage is often where the construct “intake” enters the picture. We “learn” when something we take in becomes knowledge. Indeed, in most emergentist approaches to language acquisition, learning is synonymous with building knowledge. From a UG perspective, learning, or rather acquisition, is when features have been triggered or when parameters have been set or reset, implying some adjustment within

the innate linguistic system. Can teaching play a role in this process? Apparently it can, but whatever the teaching is, according to UG theory, it needs to result in implicit knowledge because explicit knowledge does not convert to implicit knowledge.

Finally, the L1 undoubtedly plays a role in language learning. The L1 represents the principle linguistic database in a learner's memory store and can therefore not be ignored. At first contact and within the first hours of exposure to a new language, learners will use aspects of the L1 to analyze the novel TL input. Such is the case with other background languages as well. Strong effects of transparency found in the SLA research discussed in this document attest to this, certainly at the lexical level, and perhaps also at other levels of linguistic processing, including the phonemic and phonological levels, as well as morpho-syntactic.

2. What is the nature of the linguistic input, and what role does it play in learner language development?

First exposure studies and studies of the initial stages of language learning have confirmed the important role of the TL input in language development. Findings recorded in this chapter support the claim that explicit teaching can play a beneficial role in certain types of learning as measured by task type. A most interesting finding from the VILLA data underlines the important role of interaction between the input provider and the input receiver. As mentioned in Chapter 1, children's caregivers often adapt their speech to the level of the child and it is believed that this process is partially responsible for language acquisition. In the same vein, foreign language teachers often adjust their language, not only in terms of simplicity and complexity based on a learner's proficiency level, but also in terms of the variety of language constructions they use based on whether their teaching is intended to focus on form(s) and structure or not. Future research will contribute interesting insights to this discussion.

The important process of learners' mapping sound, meaning and function in spoken language has also been highlighted here. Exposure to the input is obviously required for this type of process to succeed; however, not all input is necessarily useful input. For this reason, it is proposed in this chapter that further research be conducted in the area of sound-meaning-function mapping to identify what types of tasks might enhance this mapping and help create stronger and larger knowledge stores.

3. What does the input actually look like in empirical studies of L2/L3 acquisition?

As demonstrated by the VILLA project, working closely with language teachers allows us to observe the TL input, describe it, manipulate it, and investigate how learners work on it. Such collaboration also allows us to compare the input with learners' performance on TL tasks. In fact, it may be time to blur the lines

between language acquisition and language pedagogy research in order to advance in creating more effective and efficient teaching and learning methods.

4.6 Conclusion

The relationship between language teaching and language acquisition research is a bit like driver's education. To be effective, the driving coach needs to be familiar with all the mechanisms in the car needed for driving: the steering wheel, clutch, breaks, turn signal, and so forth. The instructor needs to understand how each of these elements functions and how all the elements work together as a whole and in context (e.g. turn on the lights at sunset; do not let out the clutch and break at the same time; turn on wipers when it rains). This metaphor is useful for explaining why a language teacher should be familiar with the underlying workings of the linguistic system in order to enhance the processes by which learners acquire the language being learned. The teacher guides the student using this knowledge about the system, explaining and demonstrating aspects of the system when necessary, while also setting up situations that help learners figure out aspects of the system themselves. Add to the driving metaphor, practice makes perfect. As the apprentice driver will need 3000 km of highway driving to receive a license and become a "driver", so it is with language. Practice is needed. Ideally, the language teacher will understand the linguistic system, guide the learner in building knowledge about the system and provide the practice necessary to become a "speaker" of the language. In the same way, language teachers should be aware of what learners come to the task with (their L2/L3 initial state). This knowledge will help teachers and students better understand bootstrapping processes that can potentially speed up acquisition. Within this question is the role of the L1 – and potentially other L2s – in the learner's language development. Again, if teachers are aware of the knowledge that can be attributed to learners at the L2/L3 initial state, and especially if they know something about the background languages, the teacher can make use of this knowledge to advance more efficiently to the next step. At times, referring to a lexical item or a structure in the L1 may speed up input processing.

In his homage to Clive Perdue, Wolfgang Klein (2012: 24) tells the story of a conversation in which he asked Clive, "Can you tell me in a single sentence how the English continuous form is used?" After some thought (and more – I recommend reading the full story), Clive replies, "You use it when you are 100% in the action".

Klein writes that, although this is not what he had read in the grammar books, he found this to be a "perfect" answer for three reasons: "It is simple. It helps the learner because it takes his perspective. It captures the crucial semantic intuition". This brief explanation may not be the perfect linguistic account of the

meaning of the English progressive form, but “it contains the decisive empirical germ for such an account” (24). Following Corder (1967), Klein proposes an approach to the study of language from the learner’s perspective, keeping explanations simple and meaning at the forefront of the exercise. Building on this suggestion, first exposure research will continue to shed light on questions about language in the learner’s mind and the role of innateness in the process of language development.

Chapter 5

Conclusions and Future Research Perspectives

5.1 Introduction

The process of drafting a *thèse d'habilitation* has given me the opportunity to reflect on the development of my own research over the past two decades, inciting me to return to past research questions, hypotheses and methodologies in order to describe the progression of my work from initial projects to the present. I began investigating the effect of linguistic input on foreign language acquisition in a fairly broad sense and have, over time, focused on various factors that need to be observed and studied at first exposure and within the first hours of foreign language acquisition in order to understand fully how learners process input in the initial stages. This chapter provides a brief overview of what I consider to be the most significant research discoveries revealed in the data collected, analyzed and interpreted in collaboration with my many colleagues over the years, discoveries that will continue to inform my future research decisions.

The theoretical constructs discussed in Chapter 1 set the foundation for the discussion of my research on the early stages of foreign language acquisition presented in this document. As discussed in Chapter 1, research in language acquisition from various theoretical perspectives addresses the questions of the L1/L2/L3 initial states, the role of the L1, and the role of the target language (TL) input in foreign language acquisition. In my concluding remarks almost a decade ago (Rast 2008), I pointed out that empirical research at that time had little to say about the initial stages of L2/L3 acquisition and argued for the development of first exposure studies. As can be seen in Chapter 2, research in this domain has evolved. Numerous research groups in North America and Europe have been working to present a clearer picture of the L2/L3 initial state and of the processes involved in the first steps of perceiving, comprehending and producing in a novel TL. Chapter 3 follows this discussion with a detailed account of one such endeavor, the VILLA project (*Varieties of Initial Learners in Language Acquisition*), a large European project that investigates the initial learning of Polish as a foreign language by native speakers of French, German, Dutch, Italian and English in a tutored setting. In Chapter 4, we begin to imagine how language acquisition research and pedagogy, based on theory and empirical data, might work together to advance our thinking about how best to design and conduct foreign language instruction that is, at once, effective and efficient. Finally, this chapter returns to the initial questions posed in this document and summarizes

the essential information gleaned from the research, while also proposing future research directions that promise to move the field forward in terms of furthering our understanding of the L2/L3 initial state, the early stages of foreign language acquisition, and the process by which input becomes intake, a necessary step in the creation of a new linguistic system.

5.2 Research questions: a response

We return here to the questions posed in Chapters 1 and 2 with a brief summary of the contributions of first exposure studies, in particular the VILLA project and its predecessors, to furthering our understanding of the issues raised by these questions.

1. What is the L2/L3 initial state and what is the role of the L1?
2. What is the nature of the linguistic input, and what role does it play in learner language development?
3. What does the input actually look like in empirical studies of L2/L3 acquisition?

1. *What is the L2/L3 initial state and what is the role of the L1?*

Firstly, and perhaps most importantly, first exposure studies on both artificial and natural languages reported in Chapters 2 and 3 reveal that learners are quite capable of processing some elements of the novel speech stream and even producing (in the form of repetition at least) in a novel foreign language at absolute first exposure to that language (e.g. Carroll 2012a, 2012b; Carroll & Widjaja 2013; Gullberg et al. 2010; Gullberg, Roberts & Dimroth 2012; Han & Peverly 2007; Han and Liu 2013; Park 2011; Rast 2006a, 2008; Saffran, Newport & Aslin 1996; Shoemaker & Rast 2013, 2014; van Bergen, Shoemaker & Rast 2014). This is not an irrelevant finding given that SLA research often assumes very little knowledge (other than L1 knowledge) at the onset of new foreign language study and has paid little attention to the starting point of language learning. Based on these recent findings, the VILLA project and prior studies conducted at the University of Paris 8 set out to better understand what learners were capable of and what helped them process the new language and develop their capacities in the new language. To begin, the various research teams hypothesized that learners would rely, to a certain extent, on their linguistic knowledge (L1 and other background languages) to accomplish tasks in the TL at first exposure, a prediction that was borne out in most of the data collected and described in the present document.

With respect to the L2/L3 initial state, a particularly important finding reported in several studies is that adult learners show sensitivity to morphology immediately on first contact with the TL and within the first hours of exposure (Rast 2006, 2008). This finding does not imply that learners can correctly use and comprehend forms, but results have shown repeatedly that learners actively

analyze and work on morphological forms they hear or see in the input. Rast (2006a) shows this very clearly with a first exposure study in which participants identified endings on Polish words as markers of number and/or gender. Studies based on the VILLA dataset confirm this early sensitivity to inflectional morphology, in receptive tasks (e.g. Hinz et al. 2013) and in production data (e.g. Dimroth forthcoming; Latos forthcoming; Rast, Watorek & Latos 2015; Saturno 2015a, 2015b, 2015c).

Another important finding from the VILLA project is that speakers of different L1s clearly started at different points. In the word recognition data, for example, different L1s yielded different learning curves and apparently different L2/L3 initial states. Before instruction, French and Italian learners performed better than Dutch and German learners on transparent words (van Bergen, Shoemaker & Rast 2014). Cross-linguistic analyses of the lexical decision data have yet to be conducted, but we expect to find similar patterns, that is, that the L1 groups will show slight differences in performance on these tasks due to specific properties of their L1s relative to properties of the TL.

Another result worth investigating further is the extent to which task affects the influence of certain variables, such as the L1, on input processing at first exposure and within the first few hours of exposure. Looking again at the Grammaticality Judgment (case) and Oral Question-Answer tasks from the VILLA database, at the first test time (after 4.5 hours of instruction), although the German native speakers performed better than the French native speakers on the test eliciting judgments about case marking in Polish, the same German learners did *not* show an advantage over the French group in the production of these same items (Hinz et al. 2013). This result indicates that some process other than an L1-based one may account for the difference in performance when judging grammaticality in language versus producing language. This result is in line with the BV model proposed by Klein and Perdue (1992, 1997), in which some processes appear to be impermeable to both source and target language influence.

Regarding the role of the L1, much SLA literature addresses the issue of L1 transfer or, rather, cross-linguistic influence. In fact, as mentioned in Chapter 1, generativist-based theorists posit a hypothesis, namely the Full Transfer/Full Access Hypothesis (FT/FA, Schwartz & Sprouse 1994, 1996), which claims full transfer of the L1 to the L2. Research has shown that learners come to the acquisition process with a full system of linguistic features that will need to be reconfigured for the different types of words found in the L2 (Lardiere 2009). In fact, no one contests the claim that learners come to the L2 acquisition process with a full L1 linguistic system in place (O'Grady 2005; Perdue 1996a) and that they "transfer" elements to their L2 learner systems (Odlin 1989; Ringbom 2007; Selinker 1972; but also see Corder 1992 and VILLA results presented in Chapter

3, RQ3). It is worth noting here that, in this regard, there is nothing particularly interesting about positing a full transfer hypothesis.

Indeed, the learner varieties (LV) paradigm poses the “transfer” question differently. The LV approach assumes that L1 influence is present. How else would a true beginner even start to work on his/her novel input, and do so rapidly and successfully as evidenced by the numerous first exposure studies described in this document? Amongst the studies presented here, the VILLA project, in particular, has the potential to reply to these questions about the L2/L3 initial state and the role of the L1. By ruling out the L1 specific influence, which is possible because of the cross-linguistic nature of the project, and by ruling out the input effects, which is also possible because of the tight control of the input, we can potentially identify remaining factors that influence the language acquisition process. What remains is likely the creative aspect of the learner’s system, where the “construction” of an interlanguage takes place. This creative process will likely be found to include how learners make use of L1 knowledge as they interact with the TL input, a perspective adopted by the LV approach, and one that is very much in line with proponents of emergentist models.

As a reminder, Polish was not strictly speaking an L2 for most of the VILLA learners, but rather an L3 (in terms of chronology the third, fourth or fifth language being learned), with the exception of some of the native speakers of English and German children. As described in Chapter 2, findings from the little research conducted on the initial stages of L3 acquisition have led to constructive debates about the relative importance of other background language knowledge as it relates to the L1, the language faculty and TL input. Without a doubt, prior knowledge of languages other than the L1 has an impact on the processing and acquisition of additional languages (Cenoz, Hufeisen & Jessner 2001; De Angelis 2007; Rast 2006, 2008, 2010c, 2015). However, the type of impact is still debated (Bardel & Falk 2007; Håkansson, Pienemann & Sayheli 2002). Although the VILLA project collected background language information for its learners, it was not able to establish identical groups with respect to this factor. The effect of background languages on a learner’s acquisition of Polish will continue to be investigated in conjunction with individual or small group analyses in future studies based on the VILLA database. For instance, a German native speaker who studied Hungarian before studying Polish during the VILLA project should prove to be an interesting case study. The VILLA project will also be able to investigate the suggestion that prior experience with multiple languages may affect the way an individual learns a new language (Cenoz 1997).

The VILLA project also posed the question, what is the role of individual variability in the acquisition processes of absolute beginners? Given that the battery of individual differences tests provides additional information about the

learners, results may in fact provide new insights into the L2/L3 initial state. We have identified that learners with different L1 knowledge have different starting points relative to their new foreign language. If learners show individual differences, they may also show different starting points. In other words, the L2/L3 initial state of a given group of learners, as understood outside the UG framework, will never be identical; it will always represent some individual state and will differ from learner to learner (as per the dynamic/complex systems approach, e.g. Larsen-Freeman & Cameron, 2008; van Geert, 2008). This said, if some VILLA learners have similar profiles in terms of learner type, style, and motivation, for example, and they share the same background languages (L1 and others), analyses of their performance in Polish at first exposure could shed light on the L2/L3 initial state.

As discussed in Chapter 1, theories diverge quite drastically with respect to this question of the L2/L3 initial state, and few studies have managed to control the input in such a way that permits an empirical study of L1 effects. This ability to study L1 effects from first exposure is one of the primary contributions of the VILLA project; the beauty of the project lies in its ability to control L1 effects while comparing the TL input with learner performance in order to describe objectively how learners work on their input.

2. *What is the nature of the linguistic input, and what role does it play in learner language development?*

First exposure studies reported in the present document confirm not only that adults are quite impressive in their ability to perform on language tasks at first exposure to a novel language, but also that this ability develops rapidly (e.g. Carroll 2012a, 2012b; Gullberg, Roberts & Dimroth 2012; Hinz et al. 2013; Rast 2008; Rast et al. 2014; Shoemaker & Rast 2013; van Bergen, Shoemaker & Rast 2014).

Emergentist and interactionist models put language input at the center of language development, whereas generativist models attribute a “triggering” role to the input. In the latter, it is the input that triggers the resetting of parameters. In the former, input properties such as frequency in interaction with other factors, are responsible for language development. As such, frequency is considered an essential construct, especially in the “usage-based” account of language acquisition (Bybee 2006; Ellis & Wulff 2015; Tomasello 2003). Emergentist approaches and the LV approach assume some role of frequency, although the precise role is still under investigation.

The VILLA project and its precursors focused on two variables with respect to measuring the role of the Polish input in learner performance: transparency and frequency. In the case of the VILLA project, these input properties were carefully controlled and measured during the data collection process. Analysing these two properties is an on-going process and the data are being made available to

project members in relation to their research questions. Indeed, studies based on the VILLA database are analysing other aspects of the input as well, especially in the area of oral production, following on the ESF project and the Basic Variety (BV) model (e.g. Bernini 2017; Dimroth forthcoming; Saturno 2015a).

Frequency effects, as reported in the studies discussed in this document, appear to be irregular. In perception tasks, such as extracting words from the speech stream, or partial perception tasks, such as sentence repetitions, frequency takes time to get going; effects were generally not observed until after 6 or 7 hours of exposure. In morpho-syntactic tasks, such as grammaticality judgments and simple production, frequency effects appear to depend on task. In the receptive Grammaticality Judgment task of the VILLA project, no frequency effects were found in the French, nor in the German adult data at either time interval. Frequency effects were found in the Oral Question-Answer task, however, for both groups and at both times. These results provide a reminder about the importance of interpreting the effects of variables within the context of a specific task and linguistic domain.

Indeed, different linguistic processes need to be studied separately, at least at the beginning, in order to identify which factors play a favorable role in the development of specific processes. In other words, factors need to be understood within the context of a given task. Taking this a step further, once effects are found, analyses will need to be conducted to identify what aspects of a variable actually show an effect. Finding an effect of transparency in a word recognition task where transparent words are better extracted from the speech stream than opaque words, for example, allows us to confirm that this variable aids word recognition processes. But, we now need to know what it is precisely about “transparent” words that facilitate their extraction from a novel speech stream. What features in the transparent words made them easier for the French and Italians to process at first exposure than the Dutch and Germans? What becomes overtly blatant when describing the early stages of L2 acquisition is the importance of understanding the processes of perception of linguistic sounds, syllables and units, including segmenting the speech stream and extracting words. As Carroll (2013) rightly points out, word learning is a complex process and one that we need to understand in order to understand the workings of morpho-syntactic representations of the mind. This knowledge about the word learning process will not only inform theories of language acquisition, but also contribute to reflections on how to by-pass ineffective teaching practices to focus on effective ones.

3. What does the input actually look like in empirical studies of L2/L3 acquisition?

The VILLA project is a culmination of years of work refining methodologies to capture the input processing of learners at the early stages of foreign language learning. The end result is a dataset comprised of 14 hours of audio and video

recordings of Polish instruction for two groups of 15-20 learners in five countries, France, Germany, the Netherlands, Italy and England (176 learners for a total of 140 hours of instructor input). The recordings also include the productions of all learners in the classroom, as well as 25 tasks in Polish and 11 individual differences tests for each learner.

Given this elaborate data collection process, the database provides an unusual opportunity to describe aspects of language input in relation to learner performance. Learners interact with their input, and in so doing they learn language. The VILLA study seeks to capture this interaction with the input. A detailed description of the input is necessary, but it is only interesting when combined with a description of learner performance relative to that input. For this reason, the response to the question “What does the input actually look like in empirical studies of L2/L3 acquisition?” will develop over time as we investigate various aspects of the VILLA dataset and observe patterns in both the input and in learner performance.

5.3 The language acquisition-teaching interface

Throughout the numerous studies I have conducted with colleagues, the interface between language acquisition research and language teaching, with a special focus on the learner, has always been of particular interest to me. The questions in acquisition that have guided my research from my DEA project to the current VILLA project are also pertinent for pedagogy, as is evidenced by the fruitful collaborations between VILLA project members, language pedagogues and language teachers (e.g. Rast & Watorek 2014; Watorek, Durand & Rast 2016). In my view, the two approaches to foreign language research are complementary (Rast, Dimroth & Watorek 2011). Language acquisition research seeks to understand and describe the underlying processes involved in language development, namely, what the learner does to appropriate a new language, taking into consideration the various domains of linguistic analysis from perception to production. Language pedagogy research, on the other hand, seeks to identify, develop and use (through teaching) the most appropriate and beneficial tools and methods for enhanced and efficient language learning.

Although many questions still remain, a general trend has appeared in the literature regarding the role of implicitness and explicitness in foreign language teaching. As far as instruction is concerned, research findings indicate that the most efficient and effective teaching is one that involves a focus on meaning within contextualized interaction and communication while also providing some guidance about TL structures and properties. This is precisely the approach that the VILLA project selected for its Polish instruction. In fact, as highlighted in Chapters 3 and 4, both input conditions (meaning-based – MB, and form-based – FB) were communication-based, and both provided some information about TL

structure; the difference lies in the extent to which information about the TL structures was provided and in the way in which these structures were presented.

In Chapter 4, I describe several proposals for action in the classroom based on findings reported in this document, especially those from the VILLA project, and in response to critical analyses or suggestions made by SLA researchers from both generativist and emergentist-based research paradigms. I argue, for instance, that the role of sound-meaning mapping in the process of spoken language learning merits the attention of research in language pedagogy. If we consider the importance of sounds in spoken language, it seems reasonable to hypothesize that mastery of the TL sound system will increase a learner's effectiveness in communicating in the language. This hypothesis is based in part on results of the Phoneme Discrimination task, in which learners of all L1s after 10.5 hours of instruction were found *not* to have created new phonemic categories based solely on the Polish input to which they were exposed (i.e. without ear-training or pronunciation exercises).

In the Word Recognition task, transparency was found to aid learners in extracting words from the novel speech stream. Foreign language teachers would certainly not find this result surprising, and using transparent words in the classroom is a well-known strategy for helping students to access meaning in the TL input. However, it is important to take the effect of this variable to a deeper level to discover what it is about the construct "transparency" that aids the learner. It is also important to remind the reader that transparency was not always found to be useful. In the Oral Question-Answer task, for example, learners produced inflectional endings better on opaque words than on transparent ones (Hinz et al. 2013). Note also that the difficulty extracting opaque words could be due, at least partially, to the nature of the unfamiliar novel phonemic categories and combinations to which learners are confronted. In much initial language learning, learners hear sounds they have simply never heard before, as was the case with all the VILLA learners of Polish.

Although few analyses of the VILLA dataset have examined the effects of the two input conditions thus far, some first results of receptive tasks lend support for a teaching approach that includes the highlighting of certain TL structural properties, even at the very initial stages. Watorek, Rast and Hilton (2011), for example, showed a beneficial effect of some focus on structural properties in the input, as did Latos (forthcoming). In her comparison of the two input conditions (MB and FB) from the Polish lessons of the French native speakers, Latos found that input condition affected the instructor's use of nominal morphology. The instructor did not use more inflections in the FB input, but she regularly used a wider variety of endings. In the MB input, she used a variety of forms; however, usage of the nominative form was clearly dominant. In her analysis of the Route Directions production task data, she found that learners in the FB group used

diverse endings more frequently and regularly than did learners in the MB group, suggesting that the FB input “pushed” learners to move outside their comfort zone and experiment with non-default forms. This difference in input type and learner performance is an important finding; it appears that an approach that focuses on form influences not only the learners’ processing of the input, but also the teacher’s overall input to the learner, as suggested by interactionist approaches to language acquisition. This type of result clearly confirms the need to carefully describe the input in such a way that it can be compared to certain aspects of learner performance with a view to better understanding how learners convert their input to intake and how they make this intake available for subsequent production in conversation and interaction. Language teachers, and hence learners, will undoubtedly benefit from a better understanding of this process.

5.4 Future research

The VILLA dataset lends itself to an enormous amount of future research. In addition to securing its accessibility to the research community, my priorities in terms of this dataset include four research areas: 1) the effects of frequency and transparency on input processing and early productions; 2) the learner production data in the classroom relative to the instructor’s input and individual variability; 3) the effects of the L1 and other L2s on the performance of the English native speakers on various Polish tasks, in particular the production tasks, and on the performance of learners in replication studies; 4) the acquisition-teaching interface.

With respect to the variable frequency in the VILLA project, analyses to date have focused primarily on pre-established token frequencies in the input and their effect on a selection of tasks. Although results thus far contribute to our understanding of this variable in early foreign language acquisition, it is only with analyses of type frequencies and the relationship between the type and token frequencies that we will be able to understand fully how frequency drives productivity at the early stages. I am particularly interested in delving more deeply into the frequency of nominal morphological forms in the Polish input. A coding system to calculate these frequencies has been developed, so analyses can be conducted fairly rapidly. Once the frequencies are established, further analyses of learner performance on specific tasks will be conducted. The two tasks that focus on case marking, the receptive Grammaticality Judgment task and the Oral Question-Answer task, are particularly interesting for this analysis. Studying the interaction between transparency and specific frequencies will also be important.

The production data in the classroom are particularly rich, and once these data have been transcribed, a multitude of analyses can be conducted. Of particular

interest are comparisons between the instructor's and the learners' productions. This includes, but is not limited to, examining corrective feedback (CF), namely looking at learners' responses to the CF in the classroom and their subsequent performance on Polish tasks. Comparisons between the two input groups (MB and FB) will be an important aspect of this analysis. It is within this study that incorporating information from the individual differences tests seems most intriguing. Analysis of the classroom learner production data lends itself to individual case studies, which in turn, lend themselves to a study of a selection of learners with respect to their performance during the Polish classes (in both the MB and FB input conditions), their performance on Polish tasks, and their profile in terms of measures of individual differences. Such a study will provide the much-needed link between language acquisition research and language pedagogy.

I am also interested in working with colleagues to pursue questions within the LV approach with respect to semantic and pragmatic principles of learner varieties, more specifically in the domain of learner productions in English native speaker data (e.g. the production data elicited by the VILLA Route Direction and Finite Story tasks) and the influences of L1 English, other background languages and the input on the structure of learners' utterances. Taking a larger scope, replications of the VILLA project have already begun and promise to continue (e.g. Bernini 2016; Dimroth & Meyer 2016). Such studies will extend the VILLA results by investigating different L1-TL combinations, different socio-economic contexts, and different age groups. I look forward to collaborating with colleagues on these new projects, which will, without a doubt, contribute even further to our understanding of the early stages of foreign language acquisition.

Finally, I return to my initial reasons for entering the world of SLA research, as I wrote in the introduction to my book (Rast 2008: xiii):

My interest in the role a learner's linguistic environment plays in the process of acquiring a foreign language came out of a decade of teaching English to adult speakers of an array of other languages, in particular those whose jobs often required them to perform extraordinary feats in the English language with minimal training. I prepared them as best I could for their respective presentations and meetings, sharing the responsibility for what would result in either success or failure. The stakes were often high. Beginning to wonder to what extent my interventions helped, I made an attempt at determining the types of interventions that seemed at once most beneficial and economical. Although I found some ephemeral solutions, I was far from satisfied. I sought to learn more about what my students actually *got* from what I provided. Little did I know at the time that this was the beginning of a long journey into the study of initial processing of foreign language input.

I look forward to returning to these initial concerns, those of the acquisition-teaching interface. Having gained knowledge about how languages are learned, I am now better equipped to continue investigating this interface in my own teaching of English as an L2/L3 (as per Rast, accepted).

5.5 Conclusion

First exposure studies are beginning to provide a clearer picture of the L2/L3 initial state and what learners are capable of doing at this very early stage of adult language acquisition. More specifically, the L1 has been shown to play a powerful role in the adult learner's early development of a new TL system. At the same time, creative processes are at work in the learners' analyses of the input. As predicted by the Basic Variety (BV), learners do not rely solely on the L1, but rather, extract information from the speech signal by all means possible and use this information to create sound forms that can be recognized and mapped to meaning. Learners also identify patterns in the input, which help them recognize items as belonging to the language being learned. TL forms that are recognized, often but not always due to transparency and/or frequency, can then be processed more easily for grammatical information and eventually used in early productions. All linguistic activity, from perceiving sounds and extracting words from the speech stream to mapping these sound forms to meaning and learning the appropriate grammatical information, is necessary for the development of a new morpho-syntactic system. The VILLA project and other first exposure studies continue to investigate the questions raised here and to contribute empirical data to extant findings. For the moment, first exposure studies confirm that learners can do a lot in the earliest stages of adult language acquisition. Such studies not only affirm that capturing this linguistic activity is possible, but also suggest, as Perdue (1996a) predicted, that understanding these early stages may well be crucial for an understanding of the whole process.

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