

493 Participants' responses to each item (correct or incorrect) were analysed using the
 494 GLMM procedure in SPSS, 21, as logistic regression models have been argued to be
 495 better suited to binomially distributed data than ANOVAs (Jaeger 2008; Quene and
 496 van der Bergh, 2008). The fixed effects built into the model were Group, Sentence
 497 Type and the Group*Sentence Type interaction. Separate analyses were carried out
 498 for the two tasks.

499

500 3.1 Binding

501 Table 1.2 shows estimated mean probabilities correct and the standard error for each
 502 sentence type. The analysis revealed no significant effect of Group ($F(2, 288)=0.223$,
 503 $p=.801$) but a significant effect of Sentence Type ($F(3, 288)=14.793$, $p<.001$). No
 504 significant Group*Sentence Type interaction was found ($F(6, 288) = 0.999$, $p=.426$).

505

506

507 **Table 1.2 Estimated Mean Probabilities Correct (Standard Error) on Binding**

508

Sentence	HFA		TD KBIT		TD BPVS	
	<i>Mean</i>	<i>SE</i>	<i>Mean</i>	<i>SE</i>	<i>Mean</i>	<i>SE</i>
<i>Name Pronoun</i>	0.90	(0.04)	0.89	(0.04)	0.89	(0.04)
<i>Name Reflexive</i>	0.94	(0.03)	0.98	(0.01)	0.99	(0.01)
<i>Name Poss.</i>	0.99	(0.01)	0.99	(0.01)	0.99	(0.01)
<i>Name Name</i>	0.99	(0.01)	0.98	(0.01)	0.98	(0.01)

509 Note: HFA=high-functioning autism group, TD KBIT=typically developing group
 510 matched on raw score of KBIT, TD BPVS= typically developing group matched on raw
 511 score of BPVS.

512

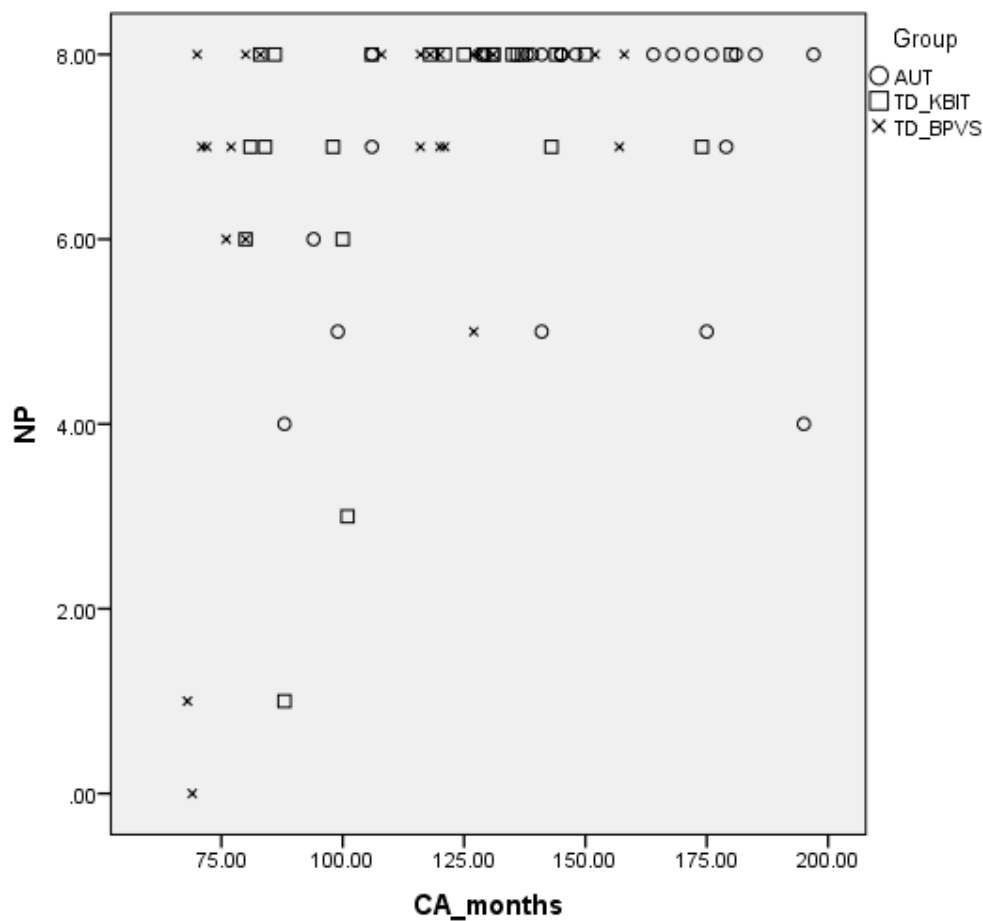
513 Pair-wise comparisons (Sidak-corrected) uncovered no difference between groups on
 514 any of the conditions. As indicated by the significant effect of Sentence Type, for all
 515 groups collapsed, children performed better on all sentence types than on the Name-
 516 Pronoun condition: Name-Reflexive ($t(288)=3.606$, $p=.001$) (OR=6.93), Name-
 517 Possessive ($t(288)=4.465$, $p<.001$) (OR=19.85) and Name-Name ($t(288)=4.191$,
 518 $p<.001$) (OR=10.77). The groups' performance did not differ on other conditions:
 519 Name-Possessive vs. Name-Name ($t(288)=.908$, $p=.722$) (OR=1.84), Name-

520 Possessive vs. Name-Reflexive ($t(288)=.941, p=.722$ (OR=2.86) and Name-Name vs.
521 Name-Reflexive ($t(288)=.474, p=.722$, (OR=1.55). In contrast to the uniformly ceiling
522 performance on the other three sentence types, the individual data in the Name-
523 Pronoun condition shows variation in all of the groups (see scatterplot in Figure 1),
524 particularly in the youngest TD BPVS group and the HFA group.

525

526 Figure 1: Scatter plot showing the relationship between age (x-axis) and children's
527 performance on *Name-Pronoun* (y-axis).

528



529

530

531 The Name-Reflexive condition also elicited a consistent ceiling performance from the
532 TD groups, although three HFA children scored at or below chance¹⁷ on this condition.
533 Individual variability in the groups' performance is shown in the scatterplot in Figure 2.
534 It is worth noting here that two of these children qualify as ALI (their score on Name-

¹⁷ We consider the score of 6 out of 8, 75%, to be above chance.

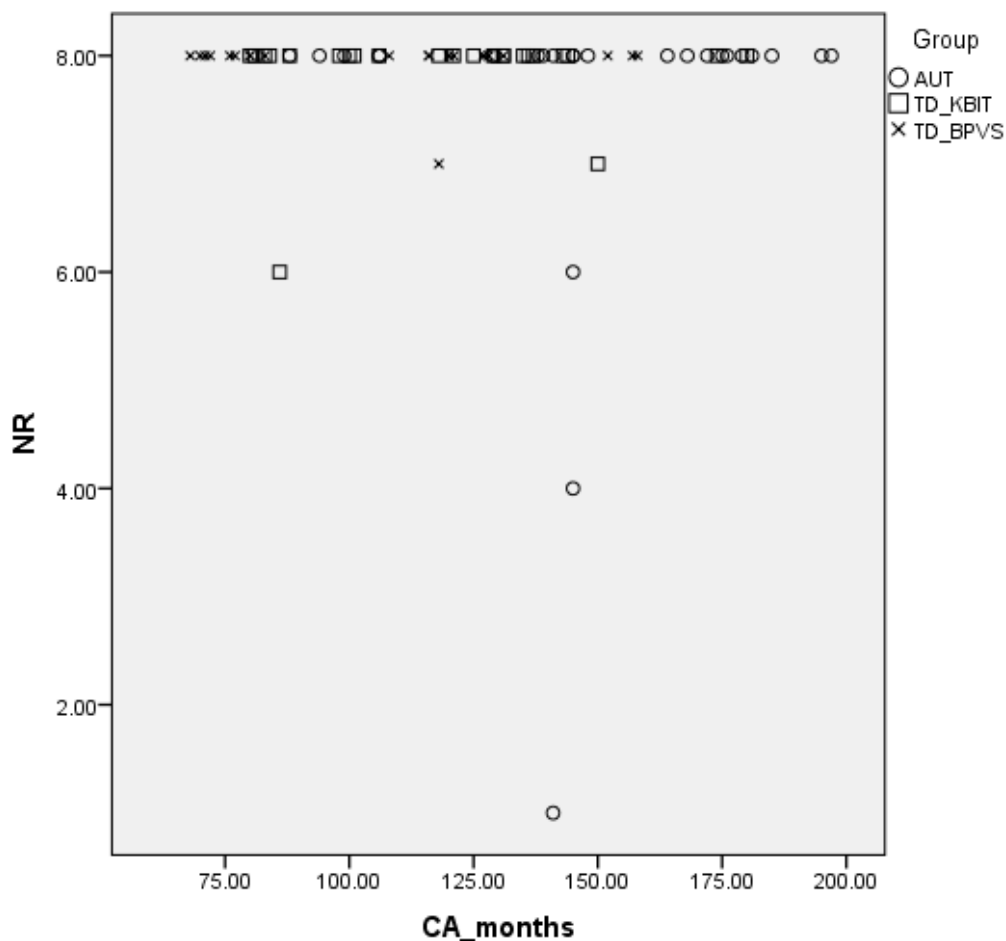
535 Reflexive were 1/8 and 3/8 correct), while one child who scored 6/8 correct was
536 borderline ALI (see footnote 11).

537

538 Figure 2: Scatter plot showing the relationship between age (x-axis) and children's
539 performance on *Name-Reflexive* (y-axis).

540

541



542

543

544 3.2 Obligatory Control

545 The analysis revealed no significant effect of Group ($F(2, 288)=2.078, p=.127$), again
546 a highly significant effect of Sentence Type ($F(3, 288)=18.540, p<.001$) and no
547 significant Group*Sentence Type interaction ($F(6, 288)=1.192, p=.310$). Estimated
548 mean probabilities correct and the standard error for each sentence type are given in
549 Table 1.3.

550

551 **Table 1.3. Estimated Mean Probabilities Correct (Standard Error) on Control**

552

Sentence	HFA		TD KBIT		TD BPVS	
	<i>Mean</i>	<i>SE</i>	<i>Mean</i>	<i>SE</i>	<i>Mean</i>	<i>SE</i>
<i>Promise</i>	0.70	(0.06)	0.92	(0.04)	0.77	(0.05)
<i>Try</i> ¹⁸	0.99	(0.01)	0.98	(0.01)	0.96	(0.01)
<i>Persuade</i>	0.96	(0.02)	0.94	(0.03)	0.95	(0.03)
<i>SVO</i>	0.99	(0.01)	0.99	(0.01)	0.97	(0.01)

553

554 The significant effect of Sentence Type for all groups when collapsed was sourced to
 555 their performance on *promise*. Sidak-corrected pair-wise comparisons revealed that
 556 the TD KBIT group performed significantly better on *promise* than the HFA group
 557 ($t(288)=3.110$, $p=.006$) (OR=4.93), and marginally better than the TD BPVS group
 558 ($t(288)=2.157$, $p=.063$) (OR=3.43). There were no differences in the performance of
 559 the HFA group and the younger TD BPVS ($t(288)=0.915$, $p=.361$) (OR=1.43).

560

561 There were no statistically significant differences in the performance of the three
 562 groups on any of the remaining sentence types (estimated mean probabilities correct
 563 were between .94 and .99 for all groups):

564 - *try* - HFA vs. TD KBIT: ($t(288)=0.090$, $p=.928$) (OR=2.02), TD KBIT vs TD
 565 BPVS: ($t(288)=1.348$, $p=.384$) (OR=2.04), HFA vs. TD BPVS: ($t(288)=1.446$,
 566 $p=.384$) (OR=4.12);

567 - *persuade* -HFA vs. TD KBIT: ($t(288)=0.465$, $p=.954$) (OR=1.53), TD KBIT vs TD
 568 BPVS: ($t(288)=0.170$, $p=.954$) (OR=0.82), HFA vs. TD BPVS: ($t(288)=0.300$,
 569 $p=.954$) (OR=1.26)

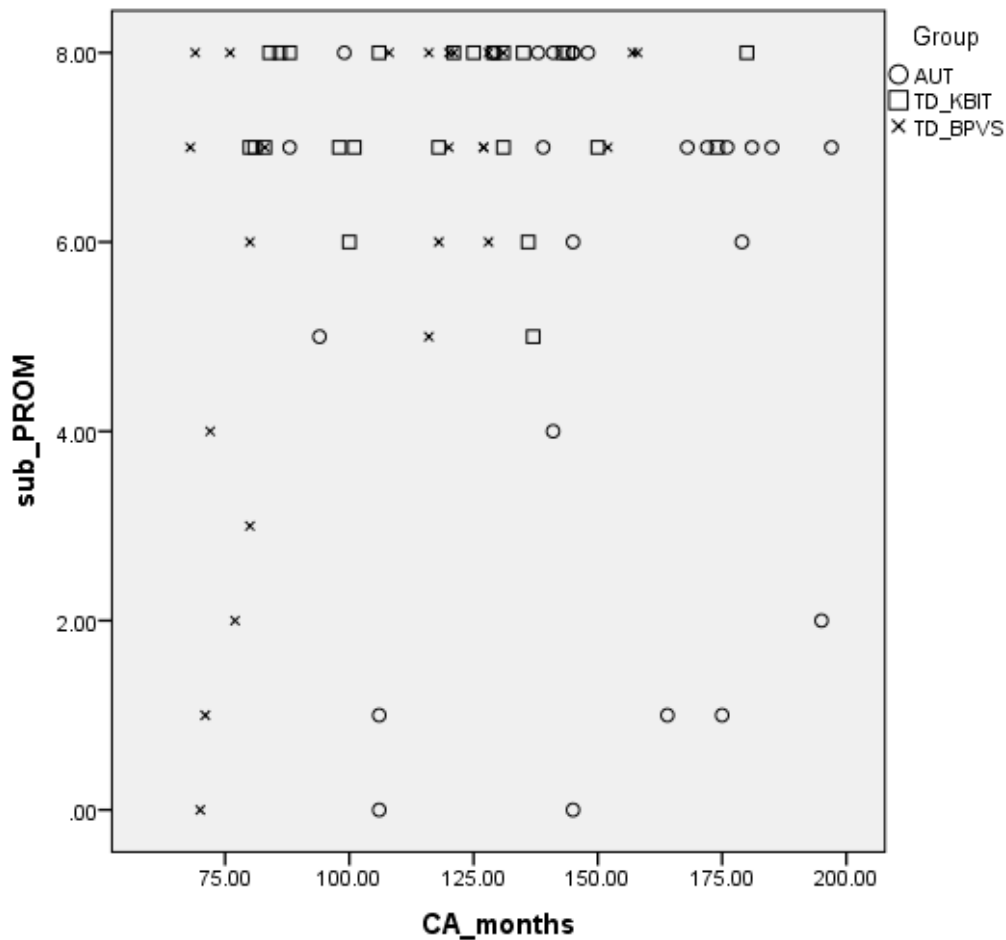
¹⁸ Note that there were two out of 85 children who made two errors on *try* (all other children made no errors, or one error only in the animate *or* inanimate sub-condition). The children who did make two errors were a HFA child, whose extremely low vocabulary and grammar scores indicated a clear language impairment, and one young typical child, aged 6;6. Their errors concerned only the animate sub-condition, which suggests that animacy may have played a role in the comprehension of *try* sentences in these two children.

570 - SVO - HFA vs. TD KBIT: ($t(288)=0.429$, $p=.668$) (OR=1), TD KBIT vs TD BPVS:
571 ($t(288)=1.347$, $p=.447$) (OR=3.06), HFA vs. TD BPVS: ($t(288)=0.987$, $p=.544$)
572 (OR=3.06).

573

574 Figure 3: Scatter plot showing the relationship between age (x-axis) and children's
575 performance on *promise* (y-axis).

576



577

578

579 In the HFA group, eight children had significant difficulties interpreting *promise* (5 and
580 less out of 8 correct), compared to six children in the TD BPVS group, and one child
581 in the TD KBIT group (see scatter plot in Figure 3).

582

583 All incorrect responses on *promise* were examined to check whether difficulties could
584 be sourced to occurrences of particular verbs, e.g. that the verb 'walk' was used twice
585 in this condition, rather than once. This was not the case in any of the groups.

586

587 **3.3. Correlation Analyses**

588 In order to ascertain the influence of age and general verbal and non-verbal abilities
 589 on the accuracy of children’s comprehension of the two sentence types which showed
 590 most variation, *promise* and *Name-Pronoun*, we ran three correlation analyses. Our
 591 findings show that age was positively correlated to performance on the *Name-Pronoun*
 592 and *promise* conditions only in the youngest TD BPVS group but not in the HFA group,
 593 or the TD KBIT group (see earlier scatterplots for a clearer view of the relationship
 594 between age and children’s performance on relevant sentence types). Performance
 595 on KBIT (measuring non-verbal reasoning), BPVS (measuring receptive vocabulary)
 596 and TROG (measuring receptive grammar) was positively correlated to the HFA
 597 group’s performance only on *promise*, but not on *Name-Pronoun*. The performance of
 598 the two typical groups on *Name-Pronoun* and *promise* was not correlated to their
 599 performance on KBIT or BPVS¹⁹.

600

601 Table 3: Pearson correlation coefficients of the relationship between children’s scores
 602 on *Name-Pronoun* (NP) and *promise* (out of 8 possible correct), and age, non-verbal
 603 reasoning (standard scores on KBIT), receptive vocabulary (standard scores on
 604 BPVS) and grammar (standard scores on TROG).

605

	HFA		TD KBIT		TD BPVS	
	NP	<i>promise</i>	NP	<i>promise</i>	NP	<i>promise</i>
Age	.226	.018	.387	.015	.439*	.549**
KBIT SS	.247	.447*	.208	.073	.370	.091
BPVS SS	.175	.474*	-.246	.148	-.003	.060
TROG SS	.361	.472*	-	-	-	-

606

607

608

609 **4. Discussion**

¹⁹ The negative correlation coefficient between BPVS and Name-Pronoun in both TD groups was due to several younger children with very high BPVS SS, who scored low on Name-Pronoun due to their young age.

610 The present study drew a comparison between comprehension of reflexive binding
611 and obligatory control in twenty-six British high-functioning children with autism and
612 two groups of TD children, individually matched on verbal and non-verbal abilities. The
613 choice of these two constructions was motivated by both clinical and theoretical
614 considerations. Its clinical import is that of contributing to the as yet still limited
615 literature on complex syntax in ASD. Obligatory control has not been studied at all in
616 this population and reflexive and pronominal binding only to a limited degree. Of
617 theoretical interest is whether the mechanism underlying control is the same or
618 different to other constructions that have been traditionally argued to involve the same
619 underlying syntactic mechanisms, such as raising. Specifically, if control is a
620 dependency involving a relation between a trace and an antecedent, we expected our
621 HFA children to exhibit difficulty with it on a par with that found for raising and passives.
622 If not movement-based, however, we expected it to pattern more closely to the results
623 found for binding. We found the latter to be true. The two sentence types that did cause
624 difficulty, and showed most variation in the groups' performance, were pronominal
625 binding (the *Name-Pronoun* condition), and particularly double-complement subject
626 control (the *promise* condition). We start our discussion with binding, indicating how
627 the current results map with the previous literature, and then move onto control,
628 drawing a distinction between the three different sub-types and the contributions that
629 the current disclosed patterns provide for our understanding of the HFA grammatical
630 profile and for our more general understanding of the nature of the control relation.

631

632 As a group, the HFA children showed a very good comprehension of reflexives, with
633 an estimated mean proportion correct of .94, suggesting intact reflexive binding. These
634 results on British children tally precisely with those found for American HFA children's
635 comprehension of reflexives as reported in Perovic et al. (2013a). Three children in
636 the current sample of twenty-six showed less than perfect performance: two performed
637 at or below chance on this sentence type, and one just above chance. Crucially, the
638 first two children qualified as ALI ('autism plus language impairment') and the third as
639 a border-line ALI, as per their scores on the standardized language assessments. This
640 is again in line with Perovic et al. (2013b), whose sample of twenty-six ALI children
641 also showed a chance performance on reflexives, which was interpreted as signaling
642 deficient knowledge of reflexive binding. However, some variability in the performance

643 of children with ALI is also noted here: one child classified as ALI showed a ceiling
644 performance on reflexives.

645

646 No difference between the three groups was observed in the pronoun condition. The
647 estimated mean proportion correct in HFA was .90, and in the two TD groups it was
648 .89. Although this is a high performance, notable variation is still evident in all three
649 groups. The variation we see in our current samples is also in line with the previous
650 literature. In Perovic et al. (2013b), twenty-two children classified as ALN ('autism with
651 normal language'), exhibited some difficulties in their interpretation of pronouns in an
652 identical task, although again, their performance did not differ from a group of non-
653 verbal MA-matched controls.

654

655 The literature on typical development reviewed in earlier sections reports that the
656 problems with pronoun interpretation disappear with age. This age-dependent
657 development is corroborated in our TD sample (especially in the younger TD BPVS
658 group), but not in our HFA group. Both age and scores on the standardized
659 assessments of non-verbal reasoning, vocabulary and syntax comprehension varied
660 greatly in our HFA participants, but none of these correlated with their performance on
661 pronouns. If we assume that there are variable levels of difficulty with pragmatics in
662 our sample, and if the interpretation of pronouns is decided at the syntax-pragmatics
663 interface, then the absence of any correlations on these measures is perhaps
664 expected.

665

666 For the obligatory control conditions, the simplest construction tested was single-
667 complement subject control (*try*). Incorrect answers would either have indicated that
668 the children permitted free interpretation of the implicit agent (where the direct object
669 in the infinitival was inanimate) or that they were employing a last-heard referent
670 strategy (where the direct object in the infinitival was animate). Ceiling performance
671 on this construction confirmed that this was not so. With regard to object control
672 (*persuade*), there was also no difference between groups. As a first test on knowledge
673 of this construction in HFA children, the results from these two regular examples of
674 control offer support for the claim that the syntax underlying canonical obligatory
675 control is preserved. The children's systematic preference for an adult-like reading

676 points to a firm grasp of the obligatory nature of the interpretative link between the
677 argument in the main clause and the understood subject in the complement.

678

679 We turn now to double-complement subject control (*promise*) for which there was a
680 varied performance, especially in the HFA children and their language-matched
681 control group with estimated mean probabilities correct of .70 and .77, respectively.
682 First of all, our finding supports all the studies that have tracked this construction's
683 development in TD children (e.g. Hsu et al. 1989; Cohen Sherman and Lust, 1993;
684 Eisenberg and Cairns, 1994). The *promise* sentences proved exceptionally difficult for
685 only a proportion of our HFA group. However, eighteen children demonstrated an
686 adult-like grasp of this construction. Let us look more closely at the eight who did not.
687 A first possibility we need to exclude is that they were not paying attention to the whole
688 sentence string. If the children attended only to the final part of the sentence, then their
689 poor performance is orthogonal to the control properties of this particular verb.²⁰ This
690 would explain their choosing the object in the *persuade* and the *promise* constructions,
691 since the picture fits with the main-clause object in both, as indicated by the underlining
692 in the examples below:

693

694 (8) (a) Homer persuaded Marge to hold the dog

695 (b) Homer promised Marge to hold the dog

696

697 Lack of attention to the main-clause verb, however, would predict that the children who
698 performed poorly on *promise* opted for the object in both *persuade* and *promise*
699 uniformly, which is true only for one of the twenty-six children. The other twenty-five
700 succeeded with *persuade* but gave mixed responses for *promise*; this equates with a
701 stage of development for this construction suggested in much previous work on
702 younger TD children (see references above).

703

704 Another possibility that needs to be ruled out is that it is the meaning of the verbs used
705 in these control examples which is responsible for these children's poor performance
706 on *promise*. If so, this again would be independent of any syntactic source to the

²⁰ We thank Nina Hyams for alerting us to this possibility.

707 problem. It is well known, for example, that individuals with ASD have an impaired
708 ability to mentalise (Happé, 1993), and the obligatory-control verbs used here all
709 involve intentions: *try* involves an intention on the part of the agent, and *persuade* and
710 *promise* both relate to or involve a change in mental states. However, the children
711 demonstrated their understanding of the verbs used in the task prior to the test itself –
712 even those children who exhibited very poor comprehension of the *promise*
713 constructions. Furthermore, problems with verbs relating to intentions cannot account
714 for the discrepancy between the children’s perfect performance on *try* and *persuade*
715 and the flawed performance on *promise*, as all three conditions employed these verb-
716 types. This line of argumentation would also not generalize to children without autism,
717 whose delayed acquisition of the *promise* construction, and not the meaning of the
718 verb itself (C Chomsky, 1969), is legendary and witnessed once again in the current
719 sample of TD children.

720

721 The question remains as to what property of the *promise* construction makes it so
722 difficult for children. The children giving mixed responses on *promise* appear reluctant
723 to break locality. This could be because of a propensity to avoid long-distance
724 dependencies generally, as reported for A-bar movement in ASD in Zebib et al. (2013)
725 for example. However, we think it more likely that for this particular construction, the
726 problem stems from the exceptional status of this type of control, and from the
727 reconciliation needed between conflicting lexical and syntactic requirements for this
728 construction, which simultaneously demand a subject and an object reference
729 respectively (see references above). There is a large number of object-controlled
730 double-complement structures (e.g. tell; order; force) relative to this one nearly
731 isolated construction which contradicts an otherwise very predictable locality rule. To
732 view the learning problem in this instance as one deriving from a deficit in establishing
733 a long-distance syntactic dependency would be far-fetched in the absence of any other
734 similar constructions against which to test. The handful of other examples of subject-
735 controlled double complements involve verbs that are highly infrequent and/or have
736 other complications (e.g. threaten; guarantee; vow to - see Boeckx and Hornstein,
737 2004), making them a poor means for comparison. Furthermore, in their responses,
738 we have seen nothing different from that witnessed in the TD literature for younger

739 children.²¹ It is also worth highlighting that at the age at which TD children have
740 mastered constructions with long-distance dependencies (see for example C
741 Chomsky, 1969, and de Villiers, Roeper and Vainikka, 1990, and Thornton and Crain,
742 1994, on long-distance wh-movement) they still falter with *promise*.

743

744 It is noteworthy that the HFA children's performance on *promise* did again not correlate
745 with age. This distinguishes them from the youngest language-matched TD group,
746 where a highly significant age-related correlation for success on *promise* was
747 observed. This correlation was also not observed in the older TD group matched on
748 non-verbal-reasoning, though their ceiling performance precluded the possibility of
749 seeing such a correlation. However, the HFA group's performance on *promise*
750 correlated moderately with their performance on the standardized tests of language
751 and non-verbal reasoning, a correlation not observed in either of the TD control
752 groups. Thus it seems that strong vocabulary and syntax comprehension is needed
753 for the above mentioned reconciliation between conflicting lexical and syntactic
754 requirements for this construction.²²

755

756 The design of the current task enables us to return to our earlier discussion of
757 experiments on argument dependencies in autism, which adopted a similar
758 experimental design (Perovic et al. 2013a, b; Perovic and Wexler, 2007), and relate
759 these to the results on regular control and binding found here. Recall that LFA- but not
760 HFA children performed deficiently on binding, whereas children with autism across
761 the low- and high-functioning range seem to show difficulties comprehending passives
762 and raising. Reflexives and the implicit subject in controlled complements require a
763 local, agreeing and c-commanding argument from which they gain their reference.
764 This much they share. On most theoretical accounts, they are also not derived by
765 movement/displacement (see Williams, 1980; Manzini, 1983; Landau, 2000; 2013;
766 Janke, 2007; Rooryck, 2007; but see Hornstein, 2001, for a raising-based account).

²¹ See Caplan and Hildebrandt (1988) for data on two aphasic patients who also show a pattern of better performance on object control, *persuade*, and a poorer performance on subject control, *promise*.

²² An approach that appears promising in terms of facilitating abstract representations of structures that children with SLI find difficult is set out in Garraffa, Coco and Branigan (2015), which used a sentence-priming paradigm effectively.

767 But the two relations cannot be conflated entirely (see also Lasnik, 1992). As
768 mentioned in the introduction, the null subjects in control also form a heterogeneous
769 set in terms of how their reference is determined, encompassing subject, object,
770 discourse, and generic interpretations. In obligatory control, it must be established
771 whether or not a particular verb selects for a controlled complement. If it does, there
772 will be a designated controller and part of the child's learning task is to grasp the
773 obligatory nature of this relationship. This selectional restriction is not operative for the
774 *ec* in non-obligatory controlled clauses, whose interpretation is regulated extra-
775 syntactically. Depending on the type of control then, namely whether it is an example
776 of obligatory or non-obligatory control, correct interpretation can call upon lexical,
777 syntactic and pragmatic knowledge. This is unlike *himself/herself*, which, whenever it
778 is the direct argument of a verb, is always an anaphor. If, as we intimated above,
779 acquisition of anaphoric dependencies is a similar yet less complicated learning task
780 to obligatory control, then a natural expectation that arose from this was that our HFA
781 children who succeeded on a picture-selection task on regular control would also
782 succeed on a picture-selection task on reflexive binding. This is exactly what we found.

783
784 The results of studies on passives and raising reviewed earlier suggest a different
785 picture for these constructions: problems appear to be evident in children across the
786 spectrum, and, most relevant to our current discussion, to HFA children. If the syntactic
787 principles underlying obligatory control differ from those that regulate passives and
788 raising, in not involving A-movement, then the bifurcation emerging here, with
789 obligatory control and binding on the one hand and passives and raising on the other,
790 makes sense theoretically. As we noted in the introduction, there have been a number
791 of recent studies into populations with ASD, using constructions whose underlying
792 movement is uncontroversial, namely *wh*-questions (Zebib et al. 2013) and relative
793 clauses (Riches et al. 2010; Durrleman and Zufferey, 2013). An interesting proposition
794 emerging from this discussion is that HFA individuals have adult-like competence of
795 reflexive binding and (regular) obligatory control but not of *wh*-movement, relative
796 clauses, passives and raising. The relations that seem to cause difficulties involve both
797 A-bar dependencies (relative clauses and *wh*-movement) and A-dependencies
798 (passives and raising), yet all involve displacement of some kind. The A-bar
799 dependencies that are most problematic are those which employ the greatest number

800 of movement operations (or constructions involving the most distance between the
801 place in which the argument surfaces and where it is interpreted), making it plausible
802 that HFA children struggle with long-distance dependencies. Yet passives and raising
803 are local relations, which suggests that displacement itself might be sufficient to cause
804 the children difficulty. Future experimentation, perhaps also on more unaccusatives,
805 can help us decide.

806

807 **5. Conclusions**

808 This paper forms a novel contribution to a line of studies dedicated to the more general
809 question of whether complex grammar is intact in children on the autistic spectrum. It
810 has taken a new example of complex grammar, namely obligatory control, and tested
811 the preferred interpretations of these constructions in HFA children. The children's
812 results on these constructions were compared with that of binding. One important
813 finding is that for regular examples of subject- and object-control and the binding of
814 reflexives, all but three children (who were classified as ALI) achieved a successful
815 performance, a result that lends support to these examples of complex grammar being
816 spared in this population. We have also discussed the degree to which properties of
817 obligatory control and binding differ from other examples of complex grammar, in
818 particular, passives and raising. The current study's results found binding and
819 obligatory control to pattern together: both were unaffected in our HFA children. We
820 contrasted this excellent performance with previous studies on passive and raising,
821 which have reported deficiencies, and suggested that together, these support a
822 distinction in terms of the syntactic operations underlying them. The significant
823 difficulties observed for the *promise* construction were not restricted to our HFA group,
824 but were also observed at a similar level in the language-matched TD controls. In line
825 with previous literature on this anomalous construction, we attribute their difficulty to
826 its breaking of locality, which is an otherwise robust grammatical principle that children
827 have already acquired and can rely on for its consistency. Children have to abandon
828 this rule for only one construction. Their reluctance to do so translates into
829 compromised acquisition.

830

831 **Appendices**

832

833 Appendix A. Binding Sentences

834

835 1. Name Reflexive

836 Bart's dad is touching himself.

837 Lisa's mum is touching herself.

838 Bart's dad is pointing to himself.

839 Lisa's mum is pointing to herself.

840 Bart's dad is washing himself.

841 Maggie's mum is washing herself.

842 Maggie's mum is dressing herself.

843 Lisa's mum is dressing herself.

844

845 2. Name Pronoun

846 Bart's dad is touching him.

847 Lisa's mum is touching her.

848 Bart's dad is pointing to him.

849 Lisa's mum is pointing to her.

850 Bart's dad is washing him.

851 Maggie's mum is washing her.

852 Maggie's mum is dressing her.

853 Lisa's mum is dressing her.

854

855 3. Name Possessive

856 Bart's dad is licking a lamp post.

857 Lisa's mum is waving a flag.

858 Bart's dad is patting a dog.

859 Maggie's mum is patting a dog.

860 Lisa's mum is driving a car.

861 Lisa's mum is playing with blocks.

862 Bart's dad is eating an ice cream.

863 Maggie's mum is eating an ice cream.

864

865 4. Name Name

866 Bart is pointing to Dad.

867 Lisa is touching Mum.

868 Bart is washing Dad.

869 Mum is dressing Maggie.

870 Dad is pointing to Bart.

871 Mum is touching Lisa.

872 Mum is washing Maggie.

873 Mum is dressing Lisa.

874

875

876 Appendix B. Obligatory Control Sentences

877 1. Single-Complement Subject Control

878 Maggie tried to wash Marge.

879 Homer tried to wash Bart.

880 Lisa tried to dress Marge.

881 Marge tried to dress Maggie.

882 Lisa tried to eat the sandwich.

883 Homer tried to eat the sandwich.

884 Bart tried to hit the punch bag.

885 Marge tried to hit the punch bag.

886

887 2. Object Control

888 Homer persuaded Marge to walk the dog.

889 Marge persuaded Homer to walk the dog.

890 Lisa persuaded Bart to build the sandcastle.

891 Bart persuaded Lisa to build the sandcastle.

892 Marge persuaded Maggie to get in the bath.

893 Marge persuaded Homer to read the book.

894 Homer persuaded Marge to drive the car.

895 Marge persuaded Maggie to pat the dog.

896

897 3. Double-Complement Subject Control

898 Marge promised Homer to walk the dog.
899 Homer promised Marge to walk the dog.
900 Bart promised Lisa to play the trumpet.
901 Lisa promised Bart to play the trumpet.
902 Lisa promised Bart to write the letter.
903 Marge promised Homer to read the book.
904 Marge promised Homer to drive the car.
905 Maggie promised Marge to pat the dog.

906

907 4. SVO

908 Homer is walking the dog.
909 Lisa is eating a sandwich.
910 Lisa is throwing water.
911 Bart is playing the trumpet.
912 Marge is driving the car.
913 Maggie is patting the dog.
914 Maggie is having ice-cream.
915 Bart is swinging a bat.

916

917 Appendix C: Familiarization procedure

918

919 Prior to the experimental task, participants were presented with pictures depicting all
920 the characters of the Simpson family on the laptop computer. The first picture showed
921 all 5 members of the family together, and the experimenter pointed out to each
922 character individually to the child: 'This is Homer, he is the dad in this family. This is
923 Marge, she is the mum in this family. These are the children: Bart, Lisa and Maggie.'
924 To ensure that the child is able to see the difference between Lisa and her younger
925 sister Maggie, the experimenter would add: 'See Maggie has a dummy here, she is a
926 baby'.
927 The following sets of picture pairs were used to ensure that the child can distinguish
928 between the characters, select the appropriate character out of the two presented on
929 the screen, and understand that the correct picture can be on either left or right side
930 of the screen:

- 931 1. Homer (left side) and Bart (right side), with the instruction: 'Point to Homer.'
- 932 2. Homer (left side) and Bart (right side), with the instruction: 'Point to Bart.'
- 933 3. Marge (left side) and Lisa (right side), with the instruction: 'Point to Marge.'
- 934 4. Marge (left side) and Lisa (right side), with the instruction: 'Point to Lisa.'
- 935 5. Lisa (left side) and Maggie (right side), with the instruction: 'Point to Lisa.'
- 936 6. Lisa (left side) and Maggie (right side), with the instruction: 'Point to baby
- 937 Maggie.'

938

939 The presentation of the above pictures was followed by pictures showing relevant
940 characters involved in an action described by the verbs used in the task: e.g. wash,
941 dry, point to and touch (Binding), and e.g. drive a car, walk the dog, play the trumpet
942 (Control).

943 The instructions uttered by the experimenter included sentences such as:

944 'Look, here we have washing/drying/touching/pointing. Marge is
945 washing/drying/touching/pointing to Maggie.' (Binding)

946 'Look, here we have driving/building/reading/walking/playing'. 'Homer is walking the
947 dog/driving the car/playing the trumpet.' (Control)

948 The experimenter would ensure that the participants can distinguish between the
949 characters before proceeding with the task. All the participants were able to follow
950 these instructions and were able to distinguish between the characters.

951

952

953

954 Appendix D: Questions used to determine knowledge of verbs independently of
955 control and representative sample of responses.

956

957 Try: what does it mean when you try?

- 958 • It's when you do something and you're not sure you can do it.
- 959 • You might not be able to do it but if you really really want to do it you can do it.
- 960 • It's like you give it a go....but you might not be able to do it.

961 Persuade: what does it mean when you persuade someone?

- 962 • You make someone do something.
- 963 • You convince someone that they do it.

964 • It's when you make someone do something.

965 Promise: what does it mean when you promise someone something?

966 • It's like when you say you'll definitely do it.

967 • I say I'll do something for sure.

968 • Once I've said I'll do it, I have to do it.

969

970 The promise question was followed up with: If you promise your mum that you will tidy
971 up your room, does that mean that you do it or you don't do it?

972 • It means I do it.

973 • I do it... well if I keep my promise.

974 • I do it.

975

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987

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