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Learning as cultural practice

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Abstract

This paper combines contributions from three sets of authors who examine the ways that learning, children's learning in particular, takes place in various contexts. One commonality amongst these contributions is that the research that is reported upon tends to approach learning as if it were a cultural practice. As such, it can be shaped through social experiences; but it can also differ widely from one cultural setting to another. The three contributions in this paper investigate language, exploratory behaviour, and family engagement in science learning. Some of the work examines understandings of the relationship between learning and social experiences like language. Other work focuses on ways to facilitate children's cultural experiences of learning. It is hoped that greater understandings of how the cultural practice of learning develops and the ways this practice can be facilitated will ultimately afford more equitable opportunities for young people in and beyond the classroom.

Introduction (Jill Hohenstein)

Parents, teachers, and other adults in learning environments all seek to provide opportunities that will help young people succeed in life (e.g. Crozier & Davies, 2005; Siraj-Blatchford, 2010). The way they think about those opportunities and the types of opportunities they provide may vary hugely. These variations may stem from diverse cultural stances on what it means to learn, on what the relationships between adults and children should be, and the nature of the resources available to the individuals involved.

Despite these differences, we suggest there is a commonality: the social situations that children participate in all instil what we refer to as a cultural practice of learning (Lave & Wenger, 1991; Rogoff, 2003). We would argue that even those situations that are not explicitly 'about learning'

can provide ways of shaping experiences such that children come to see the world and habitually act in ways that are valued by people around them. In other words, children's everyday experiences can equip them to engage in any number of learning activities they will face. For example, a sense of curiosity or passion for a topic is passed on (and also built up) from adult to child, or, more generally, from one person to another, through repeated social interactions (Barron, 2006; Mageau et al., 2009). Equally, a child's confidence in a particular domain can increase as a result of positive experiences in contexts related to that domain, leading to increased expertise and greater competence. For example, repeated exposure to family experiences of household gardening might help a child feel comfortable with knowledge about plants and a sense of competence in amateur botany (Umphress & Sherin, 2014). It is important to remember that because it is *cultural* practice we are examining, there may be differences in the opportunities associated with different groups of people who engage in different activities. These differences could be qualitative, quantitative, or both. Without establishing any one type of cultural practice as superior, understanding the range of practices is still valuable.

One thing to consider when thinking about the cultural practice of learning is whether the practice is solely applicable to one context or whether the learning is applicable across many contexts and thus exists as a mindset. On the one hand, many educational institutions would like to be able to facilitate learners' overall approach to any learning situation. That is, they would like there to be a mindset that learners acquire, which enables them to transfer an attitude or understanding from one learning situation to another. On the other hand, it may be naïve to think that learners will automatically take a practice from one situation (or one topic) to another (see Brown, Collins & Duguid, 1989). In this case, there may be certain situations that afford more learning about a particular cultural practice than do other situations. This perspective would be consistent with theories of situated learning (Lave & Wenger, 1998). In these cases, it may be important to consider the ideals and behavioural patterns of specific cultures/sub-cultures to come to a clearer understanding of the ways their cultural practices relate to learning.

In this paper, we develop the discussions begun in the conference relating to aspects of children's environments that might help them take up particular types of learning as a cultural practice. These include thinking about the myriad types of support provided by adults in places that create learning opportunities (e.g. museums), and examining the language experiences children take part in as they grow older. We look at the ways in which various institutions (e.g. families and museums) act as facilitators of learning through the ways that interaction and planning take place. We explore linguistic environments and how they relate to children's conceptual development; museum programming that can facilitate children's emotional, cognitive and motivational engagement; and how these two aspects of the environment can be combined to facilitate learning that is valued in Western school settings.

Sociocultural theory (Vygotsky, 1978) suggests that a person experiences understandings on different planes: the social, or interpsychological, and the personal, or intrapsychological. According to this perspective, learners will always take in understandings through a social filter, even if they are later developed on an individual basis into completely different views. This social filter arises from the meaningful interaction provided by people in the learner's environment, including parents, friends, and teachers, among others. One of the broad goals of education is to find ways to enhance these social interactions such that learners are able to receive the greatest possible benefit as measured by the society in which they live. Benefits might appear in cognitive advances or in affective developments that foster further cognitive and affective growth. The topics of language and motivation are explored in this paper through this lens, which provides a means of thinking about ways that children and other learners experience facilitation of cultural views. We also explore how learners can be supported to establish 'healthy' learning habits either long-term or within a particular situation.

Language has often been studied as a cultural tool. Theories such as that offered by Vygotsky (1978) on the way that language can work to help learners internalise ideas that originate on the social plane have helped researchers to develop understandings of the ways that children and other learners appropriate new ideas from the community in which they live and work. According to these perspectives, language is the means by which individuals within a community can relay thoughts about everyday activities. New members of the community can then take in this language, consider it over time, and gradually come to think of it as part of accepted knowledge. Two of the sections below, by Hohenstein and by van Schijndel, explore factors related to language and children's appropriation of ways of thinking and behaving with regard to science and museums, though they do so in very different ways.

Another aspect of how children can be seen to develop with regards to learning has to do with motivation. One theory of motivation, Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2000), suggests that relatedness, autonomy, and competence are necessary elements to maintain high levels of motivation towards a goal. Here, the sense of relatedness appears in one's desire to connect and interact with other people. Increasing a sense of relatedness associated with a task may also increase a person's intrinsic motivation to complete the task well (Deci & Moller, 2005). The need for competence suggests that all individuals feel it is important to do well at the tasks they engage in. Providing positive feedback can increase individuals' sense of competence (see Henderlong & Lepper, 2002). And the need for autonomy lies in an individual's desire to control his/her own actions (Ryan & Deci, 2000). Motivation in learners is often tied to developments in attitude (e.g. Green et al., 2012). Attitudes and motivations may be supported through formal and informal learning environments involving family, friends, and others (Barron, 2006). The section by King and DeWitt addresses issues related the facilitation of engagement through increasing feelings of relatedness, competence, and autonomy.

In all of the discussions developed below, the authors acknowledge the importance of the social environment, be it through provision of opportunities or through modelling of behaviour by more experienced people. Some contributions highlight cultural practices that remain tacit on the part of the learners and the 'scaffolders'. In contrast, other contributions seek ways of creating a more explicit awareness of practices to help institutions facilitate improved learning experiences. These social environments support and foster a cultural practice of learning. What seems to be important throughout this set of papers and across the volume is creating spaces that encourage sustained learning in ways that children (and other learners) can grow naturally in ways that are consistent with the values espoused by those around them.

Language and the art of learning (Jill Hohenstein)

Given that it is a universal means of communicating thought and feelings between various groups of people, language is a feature of life that will be encountered both inside and outside the classroom. In this discussion, I seek to emphasise ways that one type of theoretical perspective about language and thought (Linguistic Relativity) might be used as a framework to think about the cultural practice of learning in a variety of contexts.

In developing his theory of linguistic relativity, Whorf sought to show how the structure of the language people speak can influence the patterns of thought they will usually hold:

We are thus introduced to a new principle of relativity, which holds that all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar, or can in some way be calibrated (Whorf, 1956, p.214).

Somewhat similarly, Vygotsky (1978) argued that language as a cultural tool could be used to transfer knowledge between people, first as a direct means of communication, and then as a means of internal (or intrapsychological) rehearsal of ideas, leading to the internalisation of socially trans-

mitted ideas. Bringing together the ideas of Whorf (1956) with those of Vygotsky (1978), this discussion uses research about conversational language to demonstrate that children's and other learners' linguistic environments might influence ways of thinking in a wider way than just with respect to the typically studied contexts that are directly related to language typologies. That is, conversation patterns, through pragmatic uses of typical phrases, could instil typical ways of thinking in people who engage in those conversations.

Recent studies conducted on Linguistic Relativity have demonstrated that speakers of different languages tend to make judgments about events and relations in the natural world in ways that correspond to the way their language maps out those concepts (e.g. Boroditsky, Fuhrman & McCormick, 2011; Hohenstein, 2005; Levinson et al., 2002). The idea is not that speakers of these languages are unable to think in ways that do not correspond to their language. But, rather, they seem predisposed through *habitual thought* to think in ways that their language has mediated for them. In other words, their language directs their attention to particular aspects of spatial relationships, motion, colour, gender, or causality, among other things. The linguistic structure may create a habit of thinking about the world in ways that are aligned with a language's typical lexical and grammatical patterns. For example, Boroditsky et al. (2011) showed that Chinese speakers were more likely than English speakers to think of time in a 'vertical' way, consistent with the two language typologies.

Further studies have demonstrated that linguistic structures can be extracted from adult speech to children. In other words, children are exposed to the types of information they need to know about how to speak (and possibly think) in the language they are learning (e.g. Hohenstein, 2013; Weisleder & Waxman, 2010). In sum, children seem to be gaining information about what to pay attention to in their environments through the language they hear in family and other conversations.

To date, this type of explanation for the development of habitual thought has really only been employed when examining the differences between typologically distinct languages and the effects these structural differences between languages have on habitual thought (e.g. Boroditsky et al., 2011; Levinson et al., 2002). The proposal here is that we might be able to examine the learning experienced by children as they gain other types of habitual thought through the everyday conversation in which they engage with parents and other significant people in their lives. One type of thought pattern may be related to the practice of explanation and question use in conversation.

In recent years, research has focused on the type of domain-specific information children can glean through explanations and questions in informal learning talk. For example, in a study about parent-child talk about origins of species, Tenenbaum and Hohenstein (submitted) have shown that above and beyond parents' beliefs about the origin of humans, animals, and plants, mention of God or of evolution in a conversation with children predicted the children's own creationist or evolutionary beliefs. That is, children who talked about God with their families tended to endorse God as the creator of natural kinds; and children who talked about evolution endorsed evolution.

Evidence of more general influences of language on thought is only just beginning to appear in research about learning through conversation. Such studies generally focus on pragmatic elements of language as related to children's conceptual development. Luce, Callanan and Smilovic (2013) showed that parents' talk about scientific ideas that utilised a balanced way of reasoning, considering all the relevant perspectives and ideas predicted the ability of the young children's use of evidence in making a decision about an entirely different topic. That is, there appears to be a general link between the way that children think and the way their parents speak with them that goes beyond the specific topic of conversation. Similarly, Hohenstein, Callanan and Ash (2013) found that children whose parents used open-ended questions with their children at a marine science museum were more likely to provide more investigatory definitions of science (e.g. it helps you learn about things in the world) than were children whose parents did not use such questions

during a museum visit. The study also found that children who heard more open-ended questions and explanations and were provided with more explanations in turn generated a higher number of causal type questions when asked what kinds of things they wanted to learn about their favourite exhibits in the museum. Both of these studies suggest that the types of conversations in which children engage with important adults may help shape the ways they come to form broad understandings, at least about science. More research is necessary to understand how much of these conceptual developments in children are really caused by the manner in which parents speak, and how much children act in ways that lead parents to speak in a particular manner. It is likely that there is a bi-directional influence whereby children influence their parents to use certain forms of language pragmatically, which then reinforces the children's ways of thinking.

Taken together, these ideas about language in informal conversation form pieces of the puzzle to create a picture that portrays children's learning as a cultural practice that they appropriate in order to participate in the community in which they are growing up. Vygotsky's ideas are particularly pertinent because they help to understand the ways that learners can borrow the ideas from the language in which they engage with important others. But Whorf's ideas are also useful in terms of thinking of the formation of thought through language as habitual: a pattern of thinking predisposed by the (linguistic) environment to a particular attitude, view or 'way of thought'. As such, the cultural practices that children adopt may begin with, or rest upon, the language they hear in their everyday conversations, in terms of both the structure of language and the pragmatic variations in the way people speak.

Preschoolers' learning experiences in science museums (Tessa van Schijndel)

Current policies on children's education focus on preparing children for the challenges of contemporary society through teaching a broad range of skills, such as critical thinking, problem solving, creativity, and collaborating with others (Partnership for 21st Century Skills, 2014; Voogt & Pareja Roblin, 2010). One reason for the emphasis on skill-teaching is the assumption that these types of cultural practices lead to a change in children's mindset, that is, to the development of a set of skills that can be applied across many contexts. Science museums offer children and their families ample opportunity for practising a broad range of skills. For example, children and parents are challenged to think critically about causes and effects, to come up with creative solutions, and to collaborate with each other. In a series of studies, described below, my colleagues and I have explored how different types of parent guidance are related to children's cultural practices to do with skill-learning in museums, as well as the ways museums can help parents to make use of opportunities to develop these important cultural practices.

As preschoolers (2- to 6-year-olds) construct knowledge through play (e.g. Inhelder & Piaget, 1964; Singer, 2002), the acquisition of exploration skills is considered an indispensable element of their science learning. Only a small number of museum studies have specifically addressed preschoolers' cultural practices of learning, and examined this age group's skill acquisition. Crowley et al. (2001) investigated the effect of adult presence on preschoolers' exploration of exhibits. They found that children exploring an exhibit with their parents did this longer and on a deeper level than children exploring by themselves or with peers, and concluded that parents stimulate children's scientific thinking. In a follow-up study, Fender and Crowley (2007) did not find a relation between a specific type of parent explanation and young children's exploration, leaving open the question concerning the mechanisms through which parent guidance affects preschoolers' exploration.

We (Van Schijndel & Raijmakers, submitted) further investigated the relations between different types of adult guidance and preschoolers' exploration of exhibits. Two sets of studies were performed in the Dutch Science Center NEMO located in Amsterdam. The first set looked

at adult guidance on a general level: differences in guidance were defined in terms of broad coaching styles, such as scaffolding or explaining (Van Schijndel et al., 2010). The second set of studies zoomed in on one specific type of adult guidance: explanations. To this end, adult language was coded in terms of different explanation types, such as asking open questions, giving evidence descriptions, or giving causal explanations (e.g. Crowley et al., 2001; Szechter & Carey, 2009; Zimmerman, Reeve & Bell, 2009). To allow for deducing general principles about adult guidance of preschoolers' exploration, some of the research was performed in relatively controlled settings, that is, settings without other visitors, such as when the museum was closed to other visitors or in a separate room of the museum, where the adult role was performed by trained test-leaders. In contrast, some of the research was conducted in natural settings, that is, settings in which other visitors were present and parents guided their children's exploration, to allow for the studies' results to be useful for the practice of informal science education. In all studies, the Exploratory Behaviour Scale (EBS) was used to assess the preschoolers' exploratory behaviour (Van Schijndel, Franse & Raijmakers, 2010; Van Schijndel et al., 2010). The EBS is a domain-general measure, implying that it allows for assessing children's exploration skills over different contexts.

The results of the first series of studies showed that the effectiveness of different types of adult guidance highly depended on the specific exhibit. For example, at one exhibit children reached high levels of exploratory behaviour by themselves, while at the other exhibit they relied on the adult's explanation and demonstration to figure out what could be investigated at the exhibit (Van Schijndel, Singer et al., 2010). In developing an instruction video for parents that was used in the second study, we took into account these differences between exhibits by explaining how the parent could adapt their guidance to the exploratory step their child was in: getting to know the material, investigating, or concluding. It was found that the very brief intervention for adults positively influenced child exploration (Van Schijndel, Singer et al., 2010). The second series of studies demonstrated the importance of one type of adult language for guiding preschoolers' exploration: describing evidence (Van Schijndel & Raijmakers, submitted). Describing evidence implies labelling parts of an exhibit or evidence resulting from the child's manipulations. As preschoolers' executive functioning is still in development (e.g. Huizinga, Dolan & Van der Molen, 2006), it is possible that evidence descriptions provide structure to children's exploratory process by maintaining children's attention to relevant task aspects.

To conclude, this work shows that young children's exploratory behaviour is positively related to adult presence (Crowley et al., 2001), and particularly to adults describing evidence (Van Schijndel & Raijmakers, submitted). Hohenstein emphasised earlier in this paper that a linguistic environment can affect children's ways of thinking; these studies add that such an environment is also related to children's reasoning in action, that is, their exploration skills. In addition, the work showed that children can be seen to take on these cultural practices of exploration through simple facilitation of parental guidance (Van Schijndel, Singer et al., 2010). Given the current focus on skill-learning in educational policy, these are relevant results for the educational practice. In the Science Center NEMO, for example, these insights have been used in the development of a preschool exhibition (Young explorers in NEMO, 2010–2011) in which parent guidance of children's exploration was encouraged by only allowing child-parent dyads to enter the exhibition, and by having the explainer and exhibit labels address child and parent as a team. An important topic for future research concerns cultural differences in children's exploratory behaviour in museums and parent guidance of this behaviour. As science museums aim at generating enthusiasm for science in groups that are traditionally excluded from science subjects, it is important to assess whether and how the cultural practices of exploration differ between these groups (e.g. Gaskins, 2008; Whitebread & Basilio, 2013).

Facilitating family engagement in science beyond the classroom (Heather King & Jen DeWitt)

If we accept learning as a cultural practice, mediated and validated by the social interactions and constructs in which the learner lives (Hedegaard, 2010), it follows that family contexts and interactions will play a key role in shaping learning. Indeed, work by Archer et al. (2012) exploring the impact of family habitus (the ways and settings in which families operate) upon young people's aspirations in the domain of science, indicate that the family context exerts a considerable influence over the ways in which children perceive science with respect to future study or a future career.

Family habitus has also been shown to affect the outcomes of new experiences such as visits to museums. As Borun, Chambers and Cleghorn, (1996), Moussouri (1997), and Briseño-Garzón (2013) have all shown, families work as a unit as they engage with exhibits, and in so doing affirm particular family values, as well as build a common and shared understanding of the experience. Such 'work' includes sharing personal stories (McManus, 1989) practicing new vocabulary (Ash, 2003), and even joking (Zimmerman et al., 2009).

While a family as a single unit can be seen to learn, individual members within that family have varying levels of influence with regard to what is attended to. For example, we can all think of families whose weekend excursions are shaped by a child's passion for dinosaurs, or trains, or football and so on. For the most part, however, the role of gatekeeper for their family's informal learning experiences is played by the parents: parents decide upon, organise, and finance their family's physical access to places; and, more significantly, as noted in the introductory section, parents' talk can actively shape their family's intellectual access to new ideas and materials.

The impact of parental views and perceptions can be clearly seen in analyses of correlations between parental attitudes and student achievement. For example, in the statistical analysis of the 2006 Programme for International Student Assessment (PISA) survey, Perera (2014) found that, holding all else constant, when parental attitudes towards science (measured by indices on the general value of science, personal value of science, and importance of science) increased by one unit above the mean, students' test scores in science increased by 3.09 points.

In the museum context, Szechter and Carey (2009) found a similarly positive relationship between a parent's attitudes to science and the proportion of exhibits visited by the parent and child dyad. However, such a finding has worrying implications if we assume that the inverse is also true: parents with less positive attitudes to science, or those with a lack of knowledge and confidence in science, will be less likely to facilitate their family's access to particular informal learning experiences. Indeed, other researchers (Archer et al., in press) have noted that some parents report feeling disorientated by museums and that they had difficulties navigating the culture of the museum. This difficulty may be in part explained by the findings of Hoover-Dempsey and Sandler (1997), who noted that the ways in which a parent acts to support his or her child's learning will depend on how they view their own knowledge and mediation skills, and also the extent to which they are invited to become involved. In sum, parents' personal views and socio-cultural backgrounds shape the learning environments for their children, thus supporting cultural practices of learning to lesser or greater extents.

Given the varied support for learning provided by the family context, a key question facing education staff within informal learning institutions becomes: how can we best help parents to facilitate their families' engagement? A growing body of work on the nature of family conversations in museums may provide the answer.

For example, Tare et al. (2011), found that parents' use of explanatory conversation was positively related to their children's use of explanatory conversation, which in turn indicates a deeper understanding of the phenomena in question. Benjamin, Haden, and Wilkerson (2010), meanwhile, found that the use of open-ended-type questions by parents resulted in greater recall of

information in their children than closed questions. These findings would suggest a role for museum educators to model explanatory talk, and for exhibit texts to feature open-ended questions. In fact, Hohenstein and Tran (2007) found that adding an open-ended question to exhibit labels increased the explanations occurring in visitor conversations, particularly at exhibits that had relatively straightforward explanations.

Other museum researchers have sought to actively change the talk of families by training them in specific skills used in science inquiry. For example, van Schijndel Singer, Van der Maas and Raijmakers (2010) developed a seven-minute instructional video that showcased examples of ways to interact with hands-on exhibits and to engage in science inquiry. Parents who watched this video were more likely to guide their children to adopt similar techniques or approaches than those parents who had not seen the video. Allen and Gutwill (2010), meanwhile, successfully developed a family workshop that encouraged families to ask a 'juicy' question (one that the adults didn't know the answer to, but that was possible to answer), and thereafter to interpret the results of their investigation with the hands-on exhibits on the museum floor.

Other initiatives have sought to equip parents with greater confidence to engage with resources in their communities such as museums. For example, the Ecologies of Parent Engagement (EPE) framework, developed by Calabrese-Barton et al. (2004), was used in a project by the Franklin Institute for Science to help parents to leverage the knowledge, skills, and interests that they already had in order to become more actively engaged with their children's learning (Luke & McCreedy, 2012). The Enterprising Science project (Archer et al., 2015), similarly acknowledges the importance of family-held knowledge. The project comprises several studies which aim to support the building of science capital in students across a number of key dimensions, including supporting participation in out-of-school science learning contexts; showcasing the transferability of science skills and qualifications in the labour market; and enhancing students' dispositions towards science. Emerging findings suggest that adult and child dispositions towards science learning can be enhanced by emphasising the skills and funds of knowledge already held by families, and by equipping parents with greater confidence to engage with science and thus in turn support their child's engagement.

In conclusion, the challenge of facilitating family engagement in out of school settings involves equipping families with skills to scaffold their families' interactions and to more generally boost their confidence and competence to engage. Moreover, it is about helping families to draw on their collective expertise and leverage the social, cultural and scientific capital that they have amassed. As Hensley (2005) has documented, building on the body of knowledge held by parents will not only help them to engage with their child's learning, both within and beyond the classroom, it will also be an empowering and transformative experience for the parent as well. In other words, creating situations in which parents feel confident about their knowledge should help them to pass on cultural practices around learning in ways they may feel are positive to their children's development.

Conclusions (Jill Hohenstein)

The three sets of discussions outlined within this paper all relate to the ways that learners, primarily children, can be seen to take on cultural practices associated with learning. All the authors have discussed language as a cultural tool for passing knowledge and attitudes between group members. Hohenstein discussed the way that families pass on ways of thinking through the language they use in home and museum settings. Children seem to appropriate ways of thinking in a similar way to their appropriation of spatial or time perspectives as proposed by the Whorfian (1956) theory on thought and language. Van Schijndel demonstrated the manner by which parents use explanations to guide children's science learning experiences. In addition, she suggested types

of alterations a museum can make to allow preschool-aged visitors to acquire skills of exploration to a fuller extent. Finally, King and DeWitt examined family engagement in museums and noted that when parents are helped to feel confident about their own knowledge, they may be better able to help their children come to understand important concepts. All of these findings bear relation to what we have referred to in this paper as the cultural practices of learning.

It is important to remember that cultural practices of learning will look different in different cultures or sub-cultures. Whilst not suggesting that particular practices are superior or inferior in relation to others, the societies that children grow up in probably favour some kinds of practices more than they do others. So, we encourage practitioners to think about how to fit the demands of society (e.g. school) to the culture or sub-culture from which the learner has come. For example, family cultures that do not value explanation (or explanatory talk) as a means for interacting may come into conflict with Western, school-based cultures that do maintain explanatory talk as a cultural practice, particularly when it comes to succeeding in school. In contrast, children whose families engage in such explanatory talk-based practices will be advantaged in environments that promote such practices (e.g. Heath, 1983).

This is one of the reasons that the focus on differences in opportunities reflected on by King and DeWitt, as well as by van Schijndel, is extremely relevant here. By seeking ways to help families to instil cultural practices that fit in well with the school ones, it may be possible to create more equity across family learning experiences. Whilst Hohenstein's contribution may imply that learners will acquire a mindset through experiences of particular language environments, more research is necessary to see whether the types of learning involved in these sorts of experiences carry across to a wide set of contexts (e.g. from home or museum to school) or whether they are relatively situationally based.

We hope that researchers and practitioners will continue to develop ideas around motivation, attitude, and language as means to help children appropriate cultural practices of learning. Given the great amount of time children and other learners spend in out-of-classroom environments, it seems important to understand as much as possible about the cultural practices of learning that are established beyond the classroom so that learners can be supported in all of their learning environments.

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