9 Discussions of moral issues emerging in family conversations about science

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When asked about their goals for their children, parents almost always reveal their hopes that their child will develop into a good person, mentioning attributes such as respectfulness, altruism, and generosity (e.g., Azmitia et al., 1996). Popular parenting books coach parents on how to instill good character in their children; a recent trend in such books postulates that new strategies in parenting, such as supporting self-esteem at all costs, may actually undermine children’s developing morality (Weissbourd, 2009). Research on how parents attempt to instill moral values in children has provided important insights, as evidenced by many of the other chapters in this book. Despite this focus on moral issues in parenting, however, we still know relatively little about how children learn from parents about morality in incidental ways, during everyday activities that are not specifically focused on teaching morality (but see Nucci & Weber, 1995).

Even when the main topic of discussion is not morality, parents often make comments to children that touch on issues regarding how to be a moral person. We study family conversations about science topics, where the focus is often on issues of fact rather than issues of right and wrong. As several theorists have argued both in cognitive and social development, children’s reasoning is likely to vary depending on the content domain about which they are reasoning (Gelman & Baillargeon, 1983; Grusec & Davidov, 2010; Hirschfeld & Gelman, 1994; Nucci & Weber, 1995; Smetana, 1983; Turiel, Hildebrandt, & Wainryb, 1991; Wainryb, 2004). In particular, fact-based and value-based domains are likely to elicit very different types of reasoning (Kuhn, Cheney, & Weinstock, 2000; Wainryb, 2004). However, in several studies we have prompted family discussions on a number of topics of contemporary interest that straddle the boundary between science and morality; these include, for example, environmental change, the impacts of food additives, what causes gender differences, and how animals became extinct. While our focus is usually on scientific thinking, we are finding that even when asked to talk about scientific evidence in these domains, parent–child talk sometimes moves
spontaneously into the moral realm. We argue that parents sometimes bring up or respond to moral messages to the extent that they are related to their goals as parents. We employ Valle’s (2013) notion of “opportunistic guidance” – the idea that parents find openings (often “on the fly”) to discuss issues that they think are important for their children’s character and development. In addition, as we will discuss, we also find that sometimes it is the children who refocus a conversation toward issues of morality, or who adopt an absolutist moral position that blocks the parent’s attempt to guide discussion regarding the accuracy of the underlying factual claim.

Despite evidence regarding the domain specificity of children’s reasoning, the world is not neatly carved up into domains. It is likely that moral talk comes up in the midst of many other everyday activities and conversations. This is not a new idea; the point about complexity and overlap in domains has been made by Turiel, Hildebrandt, & Wainryb (1991), by Smetana (1983), and by Wainryb (2004), among others. Our contribution here, however, is to provide a particular illustration of such overlap, and to look at sample conversations in some detail in order to generate questions for future research. We consider the task of exploring some of the complexity of these everyday conversations to be a first step in beginning to determine how children unravel the many messages they hear from parents and others, and whether they are successful in learning from these messages. Further, many of the examples are instances of “opportunistic guidance,” and we suggest the usefulness of this notion for future study of everyday parent–child activity.

Moreover, moral guidance may even be particularly effective when it “slips in unawares” as unquestioned assumptions about the way the world works (Harris & Koenig, 2006), or as statements of how “we” deal with these types of questions. This may be true even when, or especially when, the primary focus is on some other topic. There are at least three possible ways that this could be true: (1) when the moral topic comes up as an aside in a conversation about something else, it may take on a less didactic and more collaborative style of guidance that encourages the child’s active engagement and co-construction of the moral domain; (2) somewhat at odds with the previous statement, Harris and Koenig (2006) suggest that off-the-cuff pronouncements stated authoritatively, including those with moral implications, may be unquestioningly accepted by the child when critical attention is focused elsewhere; or (3) conversations with parents may help children carve out domains of socialization, but when comments are made outside the appropriate domain, they may take on a particular significance, as something that applies more universally. This could suggest to the child that the topic is important enough to
“interrupt” the current topic of conversation. All of these are speculative possibilities, however, and there is a need for empirical data so we can begin to understand the nature of such conversations and their potential impact on children’s moral understanding.

In this chapter we consider in an exploratory way the kinds of discussions about moral issues that come up in the context of conversations that are ostensibly “about” something different. We explore sample parent–child conversations from several studies, asking about the ways that moral issues emerged in conversations about science topics. We have chosen to consider conversations focused on two different topics, one about the physical world and one about the social world: the environmental issue of climate change (or global warming) and the social issue of gender equity. Because this work is so exploratory, our focus here is not on quantitative data regarding how often different types of conversations came up. Rather, we take the strategy of analyzing specific examples that did arise, and using these as a basis for formulating future research questions.

In the following sections, we begin by elaborating further on the key issue of how children distinguish between epistemology and morality, and how this may emerge in parent–child conversation. Next we briefly describe the methods used in the relevant studies, as well as our criteria for identifying moral conversations. We then organize our discussion of sample conversations, attending to the notion of opportunistic guidance, as we consider discussions of morality in our conversational data about global warming as well as gender differences. Finally we finish by drawing some conclusions and suggesting future research directions.

**Intersections of epistemology and morality: Two kinds of “right?”**

Our work in the studies reported here began as an integration of socio-cultural developmental approaches with Kuhn’s work on children’s personal epistemological reasoning. Personal epistemology refers to people’s intuitive understanding about the nature of knowledge and sources of knowing. Although multiple models exist, there is agreement on a basic pattern of epistemological development, which can be described using terminology introduced by Kuhn, Cheney, & Weinstock (2000): knowledge claims are argued to be initially treated as facts known to experts (absolutism), later as purely subjective opinions (multiplicity), and perhaps eventually as complex judgments based on non-subjective criteria such as scientific evidence (evaluativism). Kuhn, Cheney, & Weinstock (2000) argue that children begin with an absolutist stance that knowledge is a matter of right or wrong, next take a multiplicity stance, with
no right or wrong answers, and finally, in fields such as science, Kuhn, Cheney, & Weinstock (2000) expect children to reach a point of taking an evaluativist stance – believing that there are right answers, but that they must be determined with evidence.

In our research we asked how parents’ conversations with children might encourage different types of epistemological stances. In the first study we discuss, for example, Valle (2013) gave parent–child dyads some conflicting claims to discuss, expecting that parents’ own views about science might lead to variation in their encouragement of an evaluativist stance. Valle (2013) also predicted that a multiplist stance might be encouraged by many parents in the middle-class US sample, given the cultural value of accepting diverse beliefs.

When we consider the possibility of moral issues arising in these conversations, a different literature on domain specificity becomes relevant. Considerable evidence supports the notion that children’s judgments about moral issues are distinct from their judgments within conventional or personal domains (Nucci, 1981; Smetana, 2006; Turiel, 2002). Moral judgments tend to be firm regardless of the views or actions of authority figures. Children judge that it is not OK to hit someone else regardless of any proposed rules to the contrary. In contrast, children seem to expect conventional rules to be changeable depending on decisions made by parents or teachers.

Even Kuhn and her colleagues found that epistemological stance is not an all-or-nothing construct, and that participants are likely to vary in their stance depending on the domain of the topic being discussed. Although they did not consider the moral domain, Kuhn, Cheney, & Weinstock (2000) found differences in epistemological understanding across five domains: taste, aesthetics, values, truths about the social world, and truths about the physical world. Among both children and highly educated adults in their studies, statements in the domain of personal tastes and aesthetics were treated as opinions (taking a multiplist stance); statements about values and physical truths were most likely to be treated as absolute facts.

The distinction between fact-based and value-based domains is a particularly important one to consider, as suggested by Wainryb’s research on children’s views about people who have beliefs that differ from their own (Wainryb et al., 2001, 2004). Somewhat consistent with Kuhn’s arguments about multiplist thinking, Wainryb et al. (2004) found that five-year-olds were less likely to make relativistic judgments, or to be tolerant of diverse beliefs, than were older children. And yet, at all ages, relativism was less acceptable in the moral realm than in the factual realm (see also Wainryb et al., 2001).
We take a socio-cultural approach in our work, which entails attention to the lived experience of children, and the view that cognition cannot be separated from everyday social and cultural practices (Rogoff, 2003). Further, our interest is in exploring everyday family conversation as a setting in which children’s developing understanding of different domains or epistemologies emerges (Luce, Callanan, & Smilovic, 2013). From our own previous research, we know that middle-class US parents sometimes encourage children to consider multiple points of view, perhaps encouraging development of a multiplist epistemology (Valle & Cividini, 2007). Of particular interest for this chapter, the distinction between fact-based (or epistemological) and value-based (or moral) domains is likely to be worked out within conversations with parents. Exploration of these conversations is a starting point for understanding how children come to make these distinctions. As Wainryb (2004) argues, moral judgments are intricately connected to factual beliefs, and children, and even adults, sometimes mistake moral disagreements for factual disagreements. The fact that there are two conversational meanings for the word “right” – factually correct versus morally right – opens up the possibility of finding both clarification and ambiguity in parent–child conversation about these topics.

Unlike in experimental studies, where children can be asked to make judgments about disagreements that prototypically represent the moral or factual realm, everyday conversations are likely to be multifaceted and complex. Taking too seriously our own analytic tools, such as researcher-defined categories or domains, runs the risk of biasing our perspective on how children’s development proceeds. Taking this view, it is completely unsurprising to find conversations about morality interspersed with those about science, not to mention other topics as well. Before we can understand how children make sense of the information they encounter in conversations with parents, it seems important to first know more about the patterns of conversation where these topics are interspersed.

**Method: Identifying moral topics in conversations**

The conversation excerpts included in this chapter come from videotapes from three studies of parent–child conversations about the natural world. Most of our examples come from a study in which 27 third- through fifth-grade children and their mothers participated, either in a family room laboratory setting or in a comfortable room at a public library in a small town in Massachusetts. This study, which we will refer to as Study 1, focused on children’s understanding of conflicting ideas and on how conversations with parents might influence these understandings.
in different domains. Participants were asked to go through a booklet containing examples of different ideas on four topics, and to talk about the ideas as if they had come up in an everyday setting. After a two-page introduction in which participants were asked to think of an example of a situation where they heard different ideas or explanations, the booklet contained different ideas on four topics. These were modeled after King and Kitchener’s (2002) Reflective Judgment Interview, a measure used to assess adult epistemological beliefs. Each topic was presented in a format previously found to elicit parent–child discussions about different ideas about the natural and social world (Valle, 2009). To illustrate, the text of the booklet on the topic of global warming was as follows:

Temperatures are becoming hotter all over the world. This is known as global warming.

Some experts say that global warming is caused by human activity like pollution from cars and factories. They believe we need to fix the problem.

Other experts think that global warming is part of a natural cycle and that recent changes are good for some parts of the world. They believe that we do not need to worry about global warming.

What do you think about these ideas?
Can you be sure that you are right?
Some questions you might want to think about:
– Why do you think that people disagree about this question?
– Is there any way that they could know for sure if their explanation is right?

Participants were free to spend as long or as little time as they wanted on each topic; however, they were encouraged to avoid extended discussions that might lose the child’s interest before they could get to all the topics. For this chapter we focus on the conversations on global warming and gender differences.

Two other studies, which we will refer to as Studies 2 and 3, were conducted at a hands-on children’s museum in a large metropolitan city in California. Families were informed about the research opportunity when they entered the museum and some agreed to participate as their first activity at the museum. Other families were approached on the museum floor and asked to participate. Families were invited to a quiet room in the museum where a parent and child dyad sat together to read and discuss science-related topics. Each conversation was videotaped.

In one museum study, Study 2, children ranged in age from five to seven, and we recruited only mothers to participate with their children. Each parent–child dyad was asked to read and discuss four stories about science-related topics for which there is conflicting evidence (e.g.,
Family conversations about science

whether human activity is contributing to climate change; whether milk makes bones stronger). Each story followed a similar format in which a story character wonders about a claim and discovers evidence for and evidence against the claim. The last page of the story asks for the reader’s ideas about what the story character should think about the claim. The primary goal of this study was to explore how mothers and children discuss conflicting evidence.

In the other museum study, Study 3, children ranged in age from three to ten (though we focused here mostly on three- to six-year-olds), and we recruited both mothers and fathers to participate. Each parent–child dyad was asked to read and discuss six science-related topics (e.g., the Earth is getting warmer; mammoths are extinct; some people think boys and girls play differently). Each topic was presented on a separate page in a book, and each page prompted them to talk about evidence for a claim by asking them to consider ‘how could someone figure out …?’ (e.g., ‘how could someone figure out why the Earth is getting warmer?’). The primary goal of this study was to explore how parents and children generate evidence for science-related topics.

Working with data from these three studies, we identified examples of conversation segments that fit the moral categories shown in Table 9.1. In the following sections we consider examples from conversations about global warming and about gender differences.

What counts as a discussion of morality?

How to define morality is a crucial question. We are well aware that this is a fraught discussion and a multifaceted concept (Graham et al., 2011); an extended discussion of these debates is beyond the scope of this chapter. For our exploratory investigation, we began with a few ideas about moral reasoning drawn from a variety of research frameworks on morality.

Beginning with Piaget’s (1965) and Kohlberg’s (2008) theories of moral development, the focus has been on children’s notions of justice, prescriptions against harming others, and the importance of being a virtuous person. Other theorists such as Turiel (2002) and Damon (1975) expanded the analysis of justice and harm in exploring ideas about developing morality and related domains. For our investigation, then, we were attentive to any mentions of ideas about harm to others, justice, and virtuousness.

More recent work, including cross-cultural studies, have shown that adults often list qualities other than justice and harm when asked
open-ended questions about what morality means to them (Graham et al., 2011). Gilligan (1982) argues that attending to women’s views of morality shifts the focus to more emphasis on caring and empathy rather than justice. In addition to the focus on individual justice and harm, participants from India and Brazil, as well as conservative participants in the United States, sometimes discussed issues that went beyond individuals, such as preservation of traditions and respect for institutions (Graham et al., 2011). In addition, recent work on children’s and adults’ views about the environment suggest some further elaborations on what morality might mean to different people. In research on children’s views about the environment, both Hussar and Horvath (2011) and Kahn, Severson, and Ruckert (2009) find children reporting a sense of personal responsibility or stewardship. Sometimes they find children discussing environmental impacts as they affect people (anthropocentric concerns), and at other times discussing harm to other living things or to Earth as a concern in itself (biocentric concerns). These findings relate to other research on Native American families’ views about nature and biological kinds (Bang & Medin, 2010). With these ideas in mind we included a separate category regarding avoiding harm to the Earth (in addition to harm to other people), as well as a category regarding personal responsibility. We also included an additional category to capture comments about tolerance of difference and adherence to conventional ways of doing things (Wainryb et al., 2001, 2004). Table 9.1 shows the types of morality discussions we looked for in our data.

In exploring the ways that issues of morality arose in these conversations, we asked about whether conversations about avoiding harm, promoting justice or fairness, being a responsible person, or tolerating difference (defined in Table 9.1) emerged. Discussions about climate change did occur that focused on harm to the Earth and harm to people, as well as occasionally issues of how to be a responsible person, and of tolerating differences. In the gender domain, in contrast moral discussions tended to focus more on tolerating differences and on issues of justice or fairness.

Results: Conversations about global warming

Avoiding harm to people or harm to the Earth

In some of the conversations about global warming, parents or children brought up problems of potential harm to people that could be brought about by climate change. (Note: except where explicitly noted, the conversations are from Study 1.) In some cases, the parent seemed to be engaging in opportunistic guidance by bringing up messages they wished
Table 9.1  Coding categories for mentions of moral issues in parent–child conversations

<table>
<thead>
<tr>
<th>Conversation categories</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Avoid harm/ promote care</td>
<td>Commenting on actions that cause harm to other people</td>
<td>“Polluting rivers will make people sick”</td>
</tr>
<tr>
<td>a. To people</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. To Earth or nature</td>
<td>Commenting on actions that cause harm to the environment, nature, Earth, sky, or water</td>
<td>“We can’t destroy the rain forests, because lots of animals will die”</td>
</tr>
<tr>
<td>2. Promote justice or fairness</td>
<td>Encouraging fairness or commenting on unjust or inequitable situations</td>
<td>“It’s not fair to treat boys better than girls”</td>
</tr>
<tr>
<td>3. Be a good or responsible person</td>
<td>Commenting on actions required to be a good person</td>
<td>“It’s important to treat all people with respect”</td>
</tr>
<tr>
<td>a. Generic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Personal responsibility</td>
<td>Commenting on specific actions that the speaker or listener should take in order to be a good person or right some wrong</td>
<td>“That’s why we recycle, so we don’t add to the garbage”</td>
</tr>
<tr>
<td>4. Tolerate differences or accept essential truths</td>
<td>Commenting on the need to tolerate or value differences, or on accepting the world as it is</td>
<td>“In some places it might be good to have less ice”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“That’s just how boys are”</td>
</tr>
</tbody>
</table>

to convey to their child. For example, one parent took the opportunity to mention her own view about ways that people may be harming the environment:

PARENT: ... we know definitely there’s some pollution and things that we’re doing to the environment that aren’t good.

[CHILD (10;9, boy): Yeah.]

PARENT: We can already tell that for sure even if it’s not causing global warming it’s not helping.

[CHILD (simultaneously): Helping.]

The focus is on harm, and use of phrases such as “aren’t good” or “it’s not helping” implies that the mother has added an element of evaluation or moral judgment into the discussion, moving away from the rational decision-making task they were given.

Similarly, in the following example, a parent of a young child mentioned the harm that global warming would have on people:

(4;0 girl – Study 3)

MOTHER: The sun is that why earth is getting hotter? [reading: Some people think that people are causing the earth to get hotter and that we need to do something...]

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We can’t let it get too hot right? It wouldn’t be comfortable, right? Then earth would be very, very hot.

In other families, it was the children who pushed the conversation toward moral issues of harm:

CHILD (8;11, boy): … because it’s not like Antarctica could melt and then come back from melting.
PARENT: So you think whatever damage we do is permanent.
CHILD: Yeah.
PARENT: OK, so, but why do you think people disagree? Why do you think that some people think that one idea is right and the other is wrong? Like you’ve chosen the first idea and you’ve said that that is right.
CHILD: Yeah, because this, the thing that it’s doing – besides half of like Florida and Europe are going to be underwater right.

Despite this parent’s attempt to bring the discussion back to the epistemological question of how to determine which view is correct, the child seems to be focused on the moral issues of harm to the environment and perhaps also to the people living in places such as Florida and Europe.

Moreover, the following example illustrates how the topic of harm to the Earth can elicit strong emotions, almost a sense of moral outrage, among children:

CHILD (8;7, boy): Because if we keep polluting in the skies, there’s going to be more pollution up into the air, right into the sky. And Israel has already taken so much global warming because there’s a lot of pollution in Israel. [uses several hand motions to depict the global warming cycle]
PARENT: Hmm. Did you see pollution over there?
CHILD: Huh! [disbelieving sounds and facial expression suggest, “how could you even ask that!”]
PARENT: You did? I don’t remember that.
CHILD: Didn’t you look at the skies! It look so polluted!
PARENT: Hmm I didn’t notice that. Hmm …
CHILD: When you saw the air base, it looked so polluted.
PARENT: Hmm.
CHILD: And Mom, [Parent: Mmhmm?] if we, if people keep putting pollution up into the air, [Parent: Mmhmm] then: bye bye, then bye bye, world!

Children’s moral absolutism, especially the strong emotional response elicited by the implicit claim that global warming harms the Earth, sometimes served to cut off discussion about the accuracy of the causal claim that pollution causes global warming. Some parents, as in the previous example, moved on to the next topic when the child became overly emotional. In other cases, as shown in the following example, the child takes an absolutist position and cuts off the parent’s attempt to introduce the notion of uncertainty, a key element of the multiplist epistemological stance:

PARENT: OK. “GlobalWarming.” [reads entire text lines 1–10] What do you think?
CHILD (9;11, girl): I think the first one is, umm, is right because animals are dying. We can prove that. We can say that there have already been animals extinct because of global warming and that’s not good.

PARENT: UmHmm.

CHILD: And I don’t think that it’s part of the natural cycle because it obviously has something to do with CO₂ [rising inflection; Parent: UmHmm] and CO₂ has been – and us, if we weren’t here then the CO₂ wouldn’t be produced. So … yeah.

PARENT: And I also just think that, you know, the timing is such that, you know, since the industrial age, which is about, you know, in the last hundred, hundred and fifty years, global warming has accelerated a lot [Child: yeah] since there’s been more factories and cars and all that kind of stuff.

CHILD: UmHmm.

PARENT: And I also just think that, you know, the timing is such that, you know, since the industrial age, which is about, you know, in the last hundred, hundred and fifty years, global warming has accelerated a lot [Child: yeah] since there’s been more factories and cars and all that kind of stuff.

CHILD: UmHmm.

PARENT: So … But I don’t think we have any way of knowing – we’ll never really know exactly which way is right, which idea is right and which idea is wrong.

CHILD: [interrupts] I think we will.

PARENT: You think we will?

CHILD: I think we will. If people do more research and more people think that it’s true [Parent: UmHmm] then we can do something about it ‘cuz it’s not natural.

Interestingly, while the work of Kahn and colleagues (Kahn & Friedman, 1995, 1998; Kahn, Severson, & Ruckert, 2009) might suggest that children and parents would focus on harm to people, this example also illustrates that many of these conversations focus on harm to the environment. Admittedly, many of the children who discussed harming the Earth fell in the older age range of Kahn’s work, where he also saw some “biocentric” talk as well as “anthropocentric” talk. Nevertheless, among families with younger children in Studies 2 and 3, parents sometimes explained the mechanisms for how climate change or human actions can lead to harming the natural world. These examples suggest that even young children sometimes recognize harm to the environment. Yet given that these causal relationships may not always be self-evident to young children, parents’ comments in these conversations may also help to scaffold children’s understanding of the harmful environmental consequences of particular types of action:

(6;5 girl – Study 3)

MOTHER: Do you know how? When the ocean gets really hot, the little fishes can’t live, they die because the temperature goes higher and higher and it’s supposed to be lower. That’s why the trees start dying right? Because there is no water to feed them. Ok?

(5;3 boy – Study 2)

MOTHER: Yes, because cars have exhaust that is not really that good for the environment and it creates a layer around the earth so that all the warm air stays next to the earth. And so it does, driving cars makes the earth hotter.
(6;9 girl – Study 3)

CHILD: So like, um, you like, whenever people leave on the lights whenever they’re like on vacation, or at the store or something, or whenever they’re sleeping, they keep the lights on, and it warms up the planet.

FATHER: So, let’s see. So you think that’s why it’s getting warmer, because it’s, because people leave their lights on … it causes.

CHILD: And because people smoke.

FATHER: And ’cuz they smoke. How about like cars, do cars cause a problem too.

CHILD: Yes because they’re that, gas it’s better to use … the only way that’s better is …

Promoting justice or fairness

There were few, if any, conversations that explicitly focused on justice or fairness in the realm of global warming.

Being a responsible person

Several families shifted from the focus on harm to the environment and spoke about what good people do, or should do. And at times they even focused more specifically on their own actions. When parents brought in very specific actions that the child and their family could or should take, these seemed like good examples of opportunistic guidance. One example from Study 2 follows:

CHILD (6;6 girl – Study 2): But, another scientist found that the Earth started to get hotter after humans started driving cars.

MOTHER: That is why sometimes – you have to learn how to bike so when you go to school you can just bike and mommy can buy one too.

CHILD: So, I don’t heat up the sun?


Similarly, in several families with younger children in Study 2, parents used the opportunity to bring in stewardship ideas about what they themselves could do to help the environment, as shown in these four examples:

(5;5 boy – Study 2)

MOTHER: What should people do to make it better?

CHILD: Not pollute.

MOTHER: Not pollute, but we drove to get here.

CHILD: Hmm … use horses to pull wagons instead of use cars?

MOTHER: Maybe people should have horses pull us, huh?

(5;10 girl – Study 2)

MOTHER: No, so what do you think the conclusion is? [child and mom both point at picture] You think it’s getting hot because of the cars … it’s making it worse because look at all that dirty pollution around our nice earth …
[points to picture] hmmm … is that why we walk so many places even though sometimes you get tired?

(6;4 boy – Study 3)
MOTHER: So that’s why we bought the Prius. That was why we bought that car because it doesn’t use as much gas so it’s better for the earth, right?

(4;9 boy – Study 3)
CHILD: It’s getting colder and hotter.
MOTHER: That’s right. And what do we do at home to make sure that we help with the environment so that the penguins and polar bears have a place to live?
CHILD: Water.
MOTHER: We watch our water, and how we spend it and we recycle huh?

Interestingly, however, at least with the older group of children in Study 1, many of these personal responsibility discussions were started by the child. Here is an example:

CHILD (8;3, girl): Global warming … [reads] That’s not good because we need to umm stop it and not make polar bears extinct.

This child focuses on what people should do to change the situation. Later the parent redirects to the epistemological question of how one could know for sure, but the child turns the conversation back to a discussion of what people need to do to change things.

PARENT: So how do you know that it’s not just part of a natural cycle that some people believe?
CHILD: Because people have been here for pretty long, not super long but pretty long, umm.
PARENT: On Earth you mean?
CHILD: Yeah and umm people have experienced it and passed it on down down down if there was a global warming and it was just something normal that comes up again and again and we don’t need to worry about it.
PARENT: Mhmm hmm.
CHILD: But this is a big change and we need to fix it.

One child spontaneously brought religion into the discussion, implying that taking care of the planet is part of a universal moral doctrine:

PARENT: [after a pause] Alright.
CHILD (9;6, boy): But we should take care of our planet because that’s what God gave us.
PARENT: Mmm Hmm [nodding]
CHILD: He gave us it and we’re supposed to take care of it.
PARENT: Mmm Hmm [nods and turns page]
CHILD: And polluting everything isn’t taking care of it.
PARENT: OK. Alright … Good answers.
In line with the notion of personal responsibility, another child even talked about it being “your fault” if environmental catastrophes occur:

**CHILD** (10;8, boy): I think the top one is right. “Some experts say global warming is ...” because, because it explained it in a TV show I watched.

After answering the mother’s questions about where the show was seen, the child goes on to say:

**CHILD**: So, anyways, I agree because I heard the movie that ... **PARENT**: So you believe that expert. **CHILD**: ... as H₂O goes up, all the gas comes up, and, and it seems to be reasonable. Because you should, you should, it won’t make good changes for everything else because eventually the water will come up and drown everyone. And everyone will die and it will be your fault if you believe in the other issue.

Our introduction to the activity in Study 1 made it clear that we were interested in evaluation of factual accuracy. In keeping with the task demands, most parents highlighted the prompts regarding epistemological concerns and encouraged children to consider reasons for the views presented. Upon reaching the end of the booklet, however, some parents flipped back to each topic page for a brief recap. Interestingly, these closing statements often shifted attention to issues of personal responsibility in the case of global warming, as in the following example.

**PARENT**: Global warming? [pause] Well any more opinions on global warming? [Child: sighs, hmm] Cars? Factories? Fixing the problem? How you gonna fix it? ’Cuz you know all the moms and dads, my age, are getting too old to do all this stuff, we have to leave it up to you guys. **CHILD** (9;8, boy): Ride my bike? **PARENT**: Ride your bike? That’s a good idea, that’s what [NAME] does sometimes in school, in Boston, he rides his friend’s bike to school, when doesn’t have to take his guitar. **CHILD**: Ride a bike [Parent: what else?] skateboard, something like that. **PARENT**: Mmm-hmm. **CHILD**: Ummmm don’t use spray cans. **PARENT**: Yeah, I can’t believe they still make those, perhaps they know they’re not any good, they should just stop making them. But see then there’s all these experts over here that probably own those companies that say, “Oh no, spray cans aren’t doing a thing!” Spray on that hairspray [laughs]. Yup.

Moreover, in some cases these closing comments provided an important message about the connection between factual accuracy and moral behavior. For example, after discussing how reducing car usage might show us whether pollution was responsible for global warming, one mother raised the question of whether we need to fix the problem. She accepted the child’s response that perhaps we should wait to figure out if pollution really is the cause. After going through the rest of the booklet, however, the mom returned to the topic as follows:
PARENT: ... I think I really liked what you had to say and I kinda thought that too. You never know what’s right but it’s good to clean up the pollution and figure out that’s causing it.

CHILD (10;9, girl): But I don’t think they should start using cars again if doesn’t get better. Because I’m sure it helps the Earth not to use gasoline.

PARENT: MmHmm. Alright.

The takeaway message seems to be that although our factual knowledge may be uncertain, actions that might reduce harm to the earth are good. This is a powerful message regarding the need for moral action in the face of uncertainty.

**Tolerating differences or accepting essential truths**

This category less clearly entails morality in the traditional sense, but at times these conversations did seem to be focused on the “right way” to think about other people or to be part of. These were conversations that focused on either relativistic thinking, such as tolerating different points of view, or on the opposite idea of accepting things as they are.

In one example, a mother argued that the notion of global warming may not be universally negative, because some people may think of it as a good thing:

PARENT (of 8;11 boy): OK, so what are the two different points of view, one point of view says what?
CHILD: That some physical warming is caused by human pollution.
PARENT: And that we need to fix that right?
CHILD: Yes.

PARENT: And the other says that this is part of a natural cycle for our planet and that it’s good for some places. Like for instance, umm some of the parts of the world that are really cold like in Canada, umm, I had read that where the ice cap is melting now ships can get in that used to not be able to get in. So it creates more jobs for the people who live there for shipping or for places that are too cold the climate is going to get warm. So that some people will say, “Well that’s OK.”

In an example that involved the oldest child in our sample, the mother grapples with core issues regarding uncertainty, action, and tolerance of diverging views. In so doing, she conveys important values regarding action in the face of uncertain knowledge:

PARENT: Do you think it would, it would make you feel better to have a right or wrong answer?
CHILD (12;2, girl): No.
PARENT: It’s OK to have this, to have something this big, this important, to just we’re still working on getting an answer?
CHILD: Yeah.
PARENT: Why?
CHILD: 'Cuz I think like, 'cuz I don’t really think there’s a right answer to this [Parent: Mmm Hmm] and from now we don’t really know for sure [Parent: Mmm Hmm] what the problem could be because we still – There’s always time, there’s always time and there’s always room to learn more things and improve on different things, so.

PARENT: [nods] Do you think it will get better as we learn more?
CHILD: I think we can make a difference as long as we are willing to try new things and learn more.

PARENT: [nods] I think as long as we don’t have fights about it. I think there are some things in here that are going to cause different, different humans to fight with each other.

CHILD: Yeah.

PARENT: And we have to be careful about that.

Conversations about gender differences

Conversations about gender differences were elicited in similar ways. For example, in Study 1 another book page contained the following information, followed by the same discussion questions as in the global warming discussion:

Boys and Girls

Boys and girls behave differently in many situations. Can you think of an example?

Some experts say that biology makes boys and girls act differently from the moment they are born.

Other experts say that society treats and expects boys and girls to behave differently and so they do.

Avoiding harm to people or harm to the Earth

Obviously harm to the Earth is not relevant in this content area, and there also seemed to be fewer conversations about any type of harm in these conversations.

Promoting justice or fairness

Again, explicit discussions of justice or fairness were uncommon, but occurred somewhat more often in conversations about gender than in conversations about the environment. What follows is one example of a mother’s comment:

PARENT (of 8;11 boy): What do you think about these ideas? Do you think that boys and girls should be treated differently because they are boys and girls?
Similarly, the following example of a comment made by a child seems to imply some injustice in the past when people thought boys were “better”:

CHILD (8;3, girl): Well, I don’t know about their body, but a long time ago everybody thought that boys were better and that the women and girls got independent and they made some stuff that kind of only girls like.

**Being a responsible person**

These conversations were rare in the gender domain. The following example is intriguing, however, because the parent points out that social convention is not the same thing as “should” in a moral sense. In other words, although she does not give guidance on what it takes to be a virtuous person in this domain, she does convey that morality and social convention are not the same thing, even if we tend to use the same word (“should”) in both cases:

PARENT: But what would you say about um how society treats and expects boys to behave?

CHILD (10;2, boy): I would say they just treat ’em like uh, how like ... you need to do, like you need to do like science, art, I mean you have to do things that involve something like a boy-thing.

PARENT: Right, and I think boys are expected to be good at science and math and girls maybe English and other subjects.

CHILD: Social studies?

PARENT: Yeah, I mean, but I think that’s not true, I think that, I think that boys … [Child: anybody can do it] and I think boys should be, you know are expected to be, interested in sports and maybe you know girls not as much so. And can you be sure that we are right on that?

CHILD: I would say yeah.

PARENT: And see with this I think that, that’s what’s expected but I think a girl can be anything she wants to be and a boy can be anything he wants to be.

After a brief consideration of why people might disagree on the cause of gender differences, the parent more explicitly signaled that social conventions can be wrong.

PARENT: And I think our society has expectations of boys and girls but they’re not necessarily the right ones, I think everybody should …

CHILD: [interrupting] Because, because everybody thought girls couldn’t do as much, as many things as a boy so.

**Tolerating differences or accepting essential truths**

Probably because of the way this dilemma was framed for families, this was the category that was most clearly represented in the conversations
about gender. Both parents and children mentioned essential truths about gender or argued against an essentialist view, and often in ways that were used to explain prescriptive beliefs about gender. For example, one brief conversation followed the earlier question about justice:

**Parent:** What do you think about these ideas? Do you think that boys and girls should be treated differently because they are boys and girls?

**Child (8;11, boy):** I don’t know, not really, kind of and kind of not.

**Parent:** No? Do you think that they are built differently, biologically?

**Child:** Yes, yes, I do.

Some fascinating conversations emerged in which parents and children grappled with issues of nature versus nurture regarding gender. The following extended conversation illustrates how parents were sometimes surprised at their children’s absolutist statements, and offered counter-examples to persuade them to consider a different view. In this respect, parents found ways to challenge children’s prescriptive beliefs (e.g., God made the men to protect the women) by challenging the informational assumptions underlying these views:

**Child (9;6, boy):** Umm, I would probably say that I think … I’m not sure. I don’t think that biology makes boys and girls act differently from the moment they were born – I just think that they are the way they are because boys were made from God and girls were made from God right?

**Parent:** Yeah.

**Child:** God made the men to protect the women

**Parent:** OK.

**Child:** And he made the women to do the sewing and knitting and stuff.

**Parent:** [laughs] Do I do sewing and knitting?

**Child:** Well, yeah, but back then though, I mean. Women did a lot of sewing and knitting to make clothes while the husbands …

**Parent:** So then how am I different? ’Cuz I don’t do any of that stuff.

**Child:** Because sometimes men join the army while the women stay back.

**Parent:** Women join the army too.

**Child:** I know but … still.

**Parent:** Umh.

**Child:** Like – oh, that’s right! Like me – I’m not that what’s it called? I just can’t, like at the party yesterday, I didn’t want to go out and dance but Susan did it because she’s a girl.

**Parent:** But Tom did it too!

**Child:** Oh, then …

**Parent:** Hmm hmmm

**Child:** Oh that’s right. I really don’t know.

**Conclusions**

Given the exploratory nature of this chapter, we have clearly raised more questions than answers. And yet we would argue that these new questions
Family conversations about science may provide fruitful directions for future research. Three major points are most apparent to us:

1. Even when the focus of their conversation is on a very different topic, parents and children engage in discussions that touch on issues of socialization and morality, often slipping back and forth between notions of ideas that are factually “right” versus morally “right.”

2. The way that moral issues are discussed seems to be quite different depending on the content domain under discussion (a physical versus a social content domain).

3. Understanding individual variation in these types of discussions may be a crucial component of research on moral development.

We briefly expand on each of these points in the remaining section of the chapter.

As a key part of parents’ goals for their children, moral socialization is likely to come up in conversation with children, and this socialization occurs in real time, not divided neatly into clear domains. Even when we asked parents to discuss topics involving scientific evidence, we found that guidance about moral issues came up in many of these conversations. At times this seemed to be an example of parents’ use of “opportunistic guidance,” when they took advantage of chances to comment on issues that were deeply held goals for their children (Valle, 2013). As Gelman (2010) argues, parents tend to employ a complicated “bundling of messages” (p. 718) in the context of everyday conversations. Children themselves were also sometimes the ones to introduce morality into the conversations, shifting from the topic at hand, illustrating the bidirectionality of development emphasized by Dunn (2010). The idea of intermixing of domains in conversations is consistent with a point made by Grusec (Chapter 14, this volume). And yet, the typology of domains being discussed seems quite different. In Grusec’s taxonomy, our conversations might be categorized in the “guided learning” domain (see also Grusec & Davidov, 2010). And yet, our data raise questions about whether parents need always be focused on guiding their children’s learning in the situations where moral discussion emerges. Future research should investigate what children learn from such moral statements that come up “on the fly.” It will be important to consider under what circumstances children take up the guidance that parents are offering, and under what circumstances they resist the shift in discussion from the factual to the moral realm or vice versa. Understanding the latter may be particularly relevant to understanding development of tolerance. It will also be important to consider whether such opportunistic discussions might have more impact than more directive discussions, given that they may be interpreted as topics that are important enough to interrupt the regular flow of conversation.
Another notion of domain differences remains relevant in this work, however, given that we found different aspects of morality to be likely to arise in conversations about different content domains. Not surprisingly, the moral issues that were most relevant to discussions of global warming were harm to people, harm to the Earth, and the importance of being a good person who takes personal responsibility for protecting the Earth. In contrast, conversations about the origins of gender differences were more likely to elicit talk about fairness and equity, as well as about tolerating differences. There are, of course, constraints on which moral issues are relevant to different areas of discussion. The consistency of the patterns of conversation that we saw was notable – and these conversations may help children to link areas of discussion with relevant moral issues.

Despite this consistency, however, there is also much individual variation in the extent to which these issues arise in conversations about science topics. We argue that the ways in which moral issues arise in these conversations are a potential influence on children’s developing views of morality, as well as intersections between morality and epistemology, and therefore a clearer understanding of this variability is essential. Our study provides an intriguing glimpse into these processes, and underscores that this may be a productive direction for future research.

Certainly, the nature of this potential link between parent conversation and children’s thinking is elusive and challenging to study. It is also likely to be conceptualized differently by researchers with different theoretical orientations. Grusec (Chapter 14, this volume) focuses on how parent–child conversations about moral issues are likely to differ depending on the domain of socialization that is most relevant. Intriguingly, she distinguishes explanations about discipline indicative of authoritative parenting in the “control” domain from personal moral stories indicative of the “guided learning” domain, in which parents’ intention is to teach their child a moral lesson. Our data and our theoretical approach, however, raise the possibility of a broadened view of the ways in which morality arises in conversations. For example, whereas Grusec (Chapter 14, this volume) expects few conversations in the “group participation” or “mutual reciprocity” domains, we propose that there may be conversations about morality where parents have no intention to teach, but where children learn through participating in mutually constructed moral understandings on the fly. Rather than using the metaphor of children “internalizing” what is deliberately taught to them (Grusec & Davidov, 2010), we wonder how productive it would be to explore more dynamic metaphors involving mutual negotiation of moral values (see Grusec, Goodnow, & Kuczynski, 2000). Kahn’s data show that parents themselves tend to report that they provide their children...
with direct instruction in moral issues related to the environment, and yet we would argue that the conversations in our data seemed only rarely to be “pedagogical” (see Callanan et al., 2012) and instead often closer to the “reciprocity” or “group participation” domains of Grusec and Davidov (2010; Grusec, Chapter 14, this volume). Further clarification of these domains and their implications is clearly needed. New issues that are not yet apparent must also be explored. For example, one open question ripe for future study is whether parents’ opportunistic guidance in the moral domain may help children to develop a “moral identity,” defined by Hardy and Carlo (2011) as a connection between reasoning and action.

Individual variation in parents’ conversations with their children must also be considered in light of cultural differences in goals for learning about science and morality. In our earlier work we found that parents vary in their emphasis on explanation and evidence in conversations about science (Callanan et al., 2013), and this variation is likely to connect to variation in parents’ cultural backgrounds, attitudes, and beliefs. For example, Bang and Medin (2010) found that Native American and European-American parents differed when discussing what they hoped their children would learn about nature. Native American parents tended to discuss their children coming to understand themselves as part of nature while European-American parents tended to discuss children respecting and taking care of nature. Perhaps cultural differences such as these would determine both whether and how discussions of morality emerge within scientifically oriented conversations.

There also may be cross-cultural differences in beliefs about how best to communicate important moral issues to children. For example, Tobin, Wu, and Davidson (1989) discuss cultural differences in whether reasoning is an appropriate way to teach preschool children about misbehavior. Also, a recent study by Silva (2011) shows an intriguing difference in parents’ views about whether teasing is an appropriate way to communicate to children when their behavior is unacceptable. Silva found that mothers of Mexican heritage were likely to see “instructional ribbing” as an effective and humane way to communicate quickly to children in the moment that they need to change their behavior. In contrast, European-heritage parents were more likely to see this type of ribbing as a negative and hurtful strategy, and they preferred reasoning with the child about their behavior in an “offline” opportunity. Perhaps once our research expands to more fully understand development within multiple cultural communities, we may begin to question the universality of findings, such as the idea that conversation about misbehavior is more effective if conducted after the event. Further exploration of the implications of such cultural
and individual variations is likely to give us a much more complete picture of how children develop moral understanding in the context of their everyday lives.

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