Handout on Abstract Properties of c & Four Theories of c

Some Abstract Properties of Confirmation Relations & Four Theories of Confirmation

1 Some Properties of Confirmation Relations

Hempel & Goodman embraced (NC), (EC) and (PC). They saw no paradox. Hempel explains away the paradoxical appearance (Goodman does same):

... in the seemingly paradoxical cases of confirmation, we are often not judging the relation of the given evidence E alone to the hypothesis H ... instead, we tacitly introduce a comparison of H with ... E in conjunction with ... additional ... information we ... have at our disposal.

Hempel's Idea: E [¬Ra & ¬Ba] confirms H [(∀x)(Rx ⊃ Bx)] relative to T, but E doesn't confirm H relative to some (nontautological) K ≠ T.

Which K ≠ T? Later, Hempel discusses K = ¬Ra. Intuition: if you already know that a is a nonraven, then observing its color will not tell you anything about the color of ravens. Hempel: (PC) is true, but (PC*) is false: (PC) ¬Ra & ¬Ba confirms (∀x)(Rx ⊃ Bx), relative to T. (PC*) ¬Ra & ¬Ba confirms (∀x)(Rx ⊃ Bx), relative to ¬Ra.

This is a good insight! Unfortunately, it is logically incompatible with the (deductive) confirmation theories that Hempel and Goodman accept.

Specifically, this possibility contradicts the K-monotonicity property:
Branden Fitelson Philosophy 148 Lecture 5

(Mk) E confirms H, relative to T \implies E confirms H relative to any K (provided that K does not mention any individuals not already mentioned in E).

- Because Hempel’s theory of confirmation satisfies (M), his theory implies that (PC) entails (PC*). So, it is logically impossible for Hempel’s theory to undergird his suggestion that (PC) is true, while (PC*) is false.

- This is bad news for Hempel/Goodman. Surprisingly, nobody noticed this inconsistency in the Hempel/Goodman approach to the paradox.

- As we will see shortly, Bayesians can better accommodate Hempel’s intuitions here, since their theories of confirmation do not satisfy (M).

- Interestingly, later in this very same passage, Hempel offers an argument for premise (1) which, itself, depends on (M)! [See my handout.]

If … E consists only of one … nonraven [~Ra], then E … confirm[s] that all objects are nonravens [(\forall x)\sim Rx], and a fortiori E supports the weaker assertion that all nonblack objects are nonravens [(\forall x)(\sim Bx \supset \sim Rx)].

- The dependence on (M) is almost invisible here! My conjecture: (M) is a vestige of “objectual” ways of thinking about confirmation (like NC0).

UCB Philosophy Confirmation Theory 04/17/08

- Quine rejects (PC) but accepts (EC). As a result, Quine rejects (1), and he argues that \( \forall F \) and \( \forall G \) in (NC) must be restricted in scope:

\[(NC') (\forall F' \in N)(\forall G' \in N)(\forall x)(Fx \& G'x \text{ confirms } (\forall x)(F'x \supset G'x))\]

- Quine calls properties \( F' \), \( G' \) satisfying (NC') “projectible.” And, he says that natural kinds are distinctively projectible in this sense.

- Many (e.g., H & G) are inclined to follow Quine in restricting (NC) to “natural kinds” (e.g., “GRUE”). But, many (e.g., H & G) reject Quine’s classification of \( \sim R \) and \( \sim B \) in particular as “unnatural”.

- Quine thinks \( R \) and \( B \) are “natural” (hence “projectible”). This may seem odd, but there is a history [esp. in metaphysics] of denying the “naturalness” of “negative properties” (denials of “naturals”).

- Some have followed Quine (Kim Quines the confirmation of psychological laws). Why should “non-naturalness” rule-out confirmation? And, what’s Quine’s theory of confirmation?

- This is another lecture! Meanwhile, let’s look at Bayesianism …

Branden Fitelson Philosophy 148 Lecture 7

- Scheffler rejects (PC), but accepts (1). He denies (EC). He proposes:

(*) A Hempelian positive instance \( E \) of a \( \forall \)-hypothesis \( H \) confirms \( H \), unless \( E \) is also a positive instance of the contrary \( H' \) of \( H \).

- Let \( H: (\forall x)[Rx \rightarrow Bx] \). The contrary of \( H \) is \( H': (\forall x)[Rx \rightarrow \sim Bx] \). Let \( E: \sim Ra \& \sim Ba \). \( E \) is a Hempelian positive instance of \( H \), and \( H' \).

- Thus, according to Scheffler’s (*), \( E \) does not confirm \( H \) after all.

- Scheffler accepts (1) [and (NC)]. \( E \) confirms \( H^*: (\forall x)[\sim Bx \rightarrow \sim Rx] \) — even according to (*). This is because \( E \) is not a Hempelian positive instance of the contrary of \( H^* \), \( H^{*'}: (\forall x)[\sim Bx \rightarrow Rx] \).

- This leads to a violation of (EC), of course, since – according to (*)& E confirms \( H^* \), but \( E \) does not confirm \( H \) — even though \( H \bimp H^* \).

- Is Scheffler’s (*) true? Exercise: show that Scheffler’s (*), and (NC) are both false from the point of view of PR-theory. I’ll return to this when we discuss I.J. Good and (NC). This will be one of the many subtle (and non-Hempelian) aspects of of probabilistic relevance accounts of c.

Branden Fitelson Philosophy 148 Lecture 8

- All Bayesian approaches begin by precisifying (NC) [and (PC)].

- Since Bayesian confirmation is a three-place relation \( [C(H,E|K)] \), we’ll need a quantifier over the implicit K’s in (NC). Four renditions:

\[(NC_\omega) (\exists K)(\forall F)(\forall G)(\forall x)[C((\forall x)(Fx \supset Gx),Fx \& Gx|K)]\]

\[(NC_\alpha) (\forall F)(\forall G)(\forall x)[C((\forall x)(Fx \supset Gx),Fx \& Gx|K_\alpha)]\]

\[(NC_\tau) (\forall F)(\forall G)(\forall x)[C((\forall x)(Fx \supset Gx),Fx \& Gx|K_\tau)]\]

\[(NC_\varsigma) (\forall K)(\forall F)(\forall G)(\forall x)[C((\forall x)(Fx \supset Gx),Fx \& Gx|K)]\]

- (NC_\omega) is too weak [let K = “all instances confirm all generalizations”].

- Hempel’s “explaining away” suggests \( (NC_\varsigma) \) should be too strong.

- So (\( NC_\alpha \)) and (\( NC_\tau \)) seem to be the salient renditions of (NC).

- Qualitative Bayesians seek to refute some rendition of (NC).

- The question for qualitative approaches is which (NC) to refute.

- Early qualitative Bayesian approaches took aim at (\( NC_\varsigma \)).
I.J. Good showed that the strong (Bayesian) rendition (NCₚ) of Nicod's condition is false. He gave the following counterexample:

\[ K: \text{Exactly one of the following two hypotheses is true:} \begin{align*}
(H) & \text{there are} \ 100 \text{ black ravens, no nonblack ravens, and} \ 1M \text{ other birds, or} \ (\sim H) \\
& \text{there are} \ 1,000 \text{ black ravens,} \ 1 \text{ white raven, and} \ 1M \text{ other birds.}
\end{align*} \]

\[ E: Ra & Ba \ (a \text{ is randomly sampled from the universe}). \]

So, \( H = (\forall x)(Rx \supset Bx) \), and \( E = Ra & Ba \). And, we have:

\[
\Pr(E | H & K) = \frac{100}{1000100} \ll \frac{1000}{1001001} = \Pr(E | \sim H & K)
\]

So, (NCₚ) is false, and even for “natural kinds” (pace Quine). Similar examples can be generated to show that (PCₚ) and Scheffler’s (*ₚ) are false.

So? Hempel replies that (NCₜ) not (NCₚ) is the salient rendition. That’s plausible, but as we have seen it’s incompatible with Hempel’s theory!

Nonetheless, Good later tried to meet Hempel's (NCₜ) challenge.

He gave the following example, which is known as “Good’s Baby”…

Here’s Good’s attempt to meet Hempel’s Challenge about (NCₜ):

…imagine an infinitely intelligent newborn baby having built-in neural circuits enabling him to deal with formal logic, English syntax, and subjective probability. He might now argue, after defining a crow in detail, that it is initially extremely unlikely that there are any crows, and therefore that it is extremely likely that all crows are black. …On the other hand, if there are crows, then there is a reasonable chance that they are a variety of colours. Therefore, if I were to discover that even a black crow exists I would consider \( H \) to be less probable than it was initially.

Even Good wasn’t so confident about this “counterexample” to (NCₜ). Maher argues this is not a counterexample to (NCₜ).

However, Maher has recently provided a very compelling (Carnapian) counterexample to (NCₜ), which is beyond our scope.

Most modern Bayesians don’t understand (NCₜ). Unlike Carnap, they have no theory of “Prₜ.” They’ve nothing to say about (NCₜ). This is why they abandon qualitative approaches in favor of the comparative/quantitative.