

MODELLING FAITH

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“And without faith it is impossible to please God, because anyone who comes to him must believe that he exists and that he rewards those who earnestly seek him.” *Hebrews 11:6* (NIV)

1. Introduction

What does it mean for a Christian to have faith in God? Moreover, how is faith related to propositional belief, personal commitment, hope and trust? Philosophical theology has long attempted to articulate the distinctions, though even here there remains some imprecision. C. Stephen Evans (1998, p.7), for example, writes:

“Doubtless...the kind of faith that the Bible holds up as an ideal includes trust in God, beliefs about God and belief that what God has said is true, and a certain willingness to be obedient to God. These three components are not necessarily separable. Though...it is not always easy to distinguish trust, belief and obedient action as distinct entities, for trust actually *consists* at least partly in having certain beliefs and in being willing to act in particular ways.” (italics in original)

Evans defines faith as comprising trust, belief and obedience. These concepts are all necessary to faith. Likewise, reformed epistemologists such as Alvin Plantinga (2000) also argue that both cognitive and volitional processes are central to faith. Faith involves a reorientation of the will as well as a change of opinion.² While it is easy to concur with these judgements, it is less clear how precisely the elements of faith are linked together.

The aim of this study is to try to use a simple decision theoretic model of trust within which to define these concepts and pin-down their interrelations. To provide some control on the structure of the argument, the essay pays particular, but not exclusive, attention to the most well known biblical discourse on faith, namely the epistle to the Hebrews, especially chapter 11. To keep the discussion manageable, there will only be limited, rather than extensive, references to other biblical texts that refer to faith. Similarly, consideration of the role of faith in salvation will be brief.

The format of the paper is as follows. After discussion of two anticipated objections to the project, the literature on trust is introduced and a standard version of the trust game briefly outlined. The game is then used to discuss two alternative positions on the nature of Christian faith, namely faith as belief and faith as action.

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² See, for example, Plantinga (2000, pp.249, 269-70, 293)

Qualifications

To begin, two qualifications are offered to defuse potential objections to the enterprise of modelling faith.

First, an obvious criticism of the project is that an economic model necessarily privileges categories of exchange. This can be seen as both excessively reductionistic and inevitably serving to impoverish and commodify Christian faith. For interpreting faith as a transaction does not capture the richness of what it means to know God and the power of his resurrection and the fellowship of sharing in his sufferings (Philippians 3:10). Nevertheless, even in Philippians, the apostle Paul uses exchange language of profit, loss and gain (3:7-8) to argue that the benefits of faith in Christ easily surpass those formerly derived from his impressive Jewish credentials, activities and reputation. So in defence it can be argued that although the economic approach is incomplete, it is not intrinsically antithetical to the way a believer thinks about faith.³

Second, it is important to distinguish carefully between ontological and methodological reductionism (Alexander, 2001, p.276). *All* discussions of faith, whatever the approach, are *methodologically* reductionistic in the sense that the analysis abstracts from some complexities in order to focus the investigation on particular features of interest. A model only provides a representation of reality. It is neither synonymous with that reality nor exhaustively descriptive (Alexander, p.284). Far more objectionable is the ontological form of reductionism which claims that the object of study (faith) is nothing but that which the model describes, or merely or only this. By contrast, the ambition here is the modest one of using a very simple model to try to say something, but not everything, about what faith might mean and imply as precisely as possible.

2. The Trust Literature

The approach adopted here is to modify insights provided by social scientific models of trust. The trust literature is enormous, having generated interest in sociology, management, economics as well as philosophy. From an economic perspective, the benefit of trust is that it provides a low cost mechanism for facilitating exchange and cooperation when monitoring is costly and contracts are costly to write or verify or enforce. Indeed, empirical studies suggest that high trust environments display better economic performance (La Porta *et al*, 1997).

In what follows, absolutely no effort will be made to survey or critique economic studies of trust in any systematic way. For those who are interested Hardin (2002), Nooteboom (2002) and Ostrom and Walker (2003) provide recent book length treatments of some of the issues and James (2002) is also useful. Early contributions to the literature on rational trust include Gambetta (1988), Dasgupta (1988), Coleman (1990), and Kreps (1990). Recent experimental investigations of trust games are primarily concerned to explain why trust arises even when the

³ The economic approach is clearly inconsistent with fideism, the claim that the rationality of faith is irrelevant for faith. On this view, one cannot arrive at true religious beliefs as a result of rational reflection and there is no neutral knowledge of God independent of faith. For Kierkegaard, for example, faith is defined as a set of spiritual sensitivities and capacities that are a precondition for knowing God.

trusted party faces material incentives to be untrustworthy in one shot games with strangers (Camerer, 2003; Berg, Dickhaut and McCabe, 1995).

The trust research is particularly helpful because the debate over appropriate models for religious faith is paralleled to some degree in discussions of non-religious trust. For example, there is dispute over whether trust is cognitive or non-cognitive, that is whether it is primarily to do with beliefs or actions, and whether it is chosen or simply exists as an assessment of trustworthiness. Of course, drawing attention to these parallels immediately privileges a view of faith as trust. But since the competing definitions of trust reflect commonly proposed alternative meanings of faith, nothing is lost from assuming that faith is trust and then investigating what conceptualisation of trust in God is most adequate.

3. A Sequential, Two Person, Binary Choice, One Sided Trust Game

The simple trust game has two players, the truster (R) and the trusted (D). The game tree is given in Figure 1 below. The first mover is the truster who chooses whether to trust or withhold trust. If she declines to trust, both parties receive the status quo (or outside option) payoff (S). If the truster chooses to trust then the trusted gets to move. He chooses whether to fulfil or violate the first mover's trust. Assuming that $G > S > B$ then if trust is honoured, this gives the best outcome for the truster (payoff = G) but if trust is exploited it gives the worst outcome for the truster (payoff = B).⁴ The truster is exposed to risk since she is worse off if trust is violated than if she had not trusted at all ($B < S$). On the other hand, she gains from trust if it is respected ($G > S$).

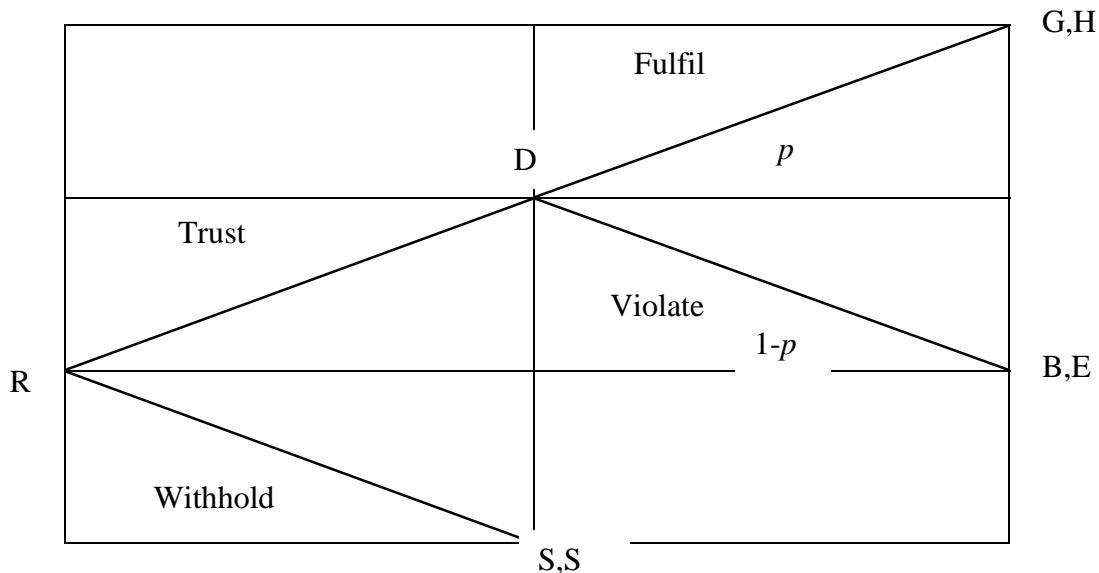


Figure 1: Extensive form of the trust game

⁴ The bad outcome B can include a betrayal cost arising from an aversion to being betrayed (Bohnet and Zeckhauser, 2003). The higher this aversion, the lower is B .

The problem for the truster is that if she cannot observe the trusted's utilities, she does not know what incentives he faces and so what move he will make. The game is then one of asymmetric information regarding the trusted's payoffs since only the trusted knows his type. There are two types of second mover. For the trustworthy type, $H \geq E$ so trust will be honoured. For the untrustworthy type, $H < E$ and trust will be violated. The truster has a belief p over the probability that trust will be fulfilled. The belief p then is the truster's assessment of the trustworthiness of the trusted. It is her expectation that he will be trustworthy.

The expected gain from trust is given by $pG + (1 - p)B$. Trust is rational if the expected gain exceeds the status quo payoff

$$pG + (1 - p)B \geq S. \quad (1)$$

In this model, trust is a form of conditional cooperation.

The game theoretic approach to trust is not without its critics. Williamson (1993), for example, argues that decisions calculated on the basis of expected net gain do not imply any trust at all and invoking the concept of trust in such cases confuses rather than adds value to the analysis. Williamson identifies trust as personal and, as such, mercenary calculation of trustworthiness is inimical since it serves to degrade a relationship. Rather to trust others is to treat them in a non-calculative way, presupposing benign intent even if a bad outcome obtains. According to Williamson, personal trust is particularly evident in relations between family, friends and lovers. Despite the cogency of this critique, and its obvious appeal in the context of faith, the notion of personal trust has not been subsequently developed in any tractable analytical way.⁵ Its usefulness remains an open research question.

Regarding the limits of the calculative model, it ought to be noted that it does not attempt to explain how individuals form views on the parameters B, G, S, p . Clearly no one explicitly speculates on their possible numerical values when making a trust decision. Indeed, boundedly rational individuals are more likely to adopt simple rules of thumb for trust.⁶ But in the absence of any such rule of thumb model in the trust literature, the trust game is at least worthy of consideration. It offers a (potentially) useful heuristic device both for thinking about the nature of faith and also for predicting under what conditions faith is more likely, rather than an accurate description of the mechanisms by which trust arises.

4. Christian Faith and the Trust Game

A characteristic of monotheistic religious faith in general, and Christian faith in particular, is that exchange is sequential. Given divine revelation in creation and salvation history, the

⁵ The personal element appeals, for example, to Christian philosopher Keith Yandell (1990, p.461) who writes, "Monotheistic propositional faith plus monotheistic practical faith is still empty without monotheistic personal faith".

⁶ Thanks to Michael Pollitt for this point.

believer decides whether to trust God's promises. As the fulfilment of these promises is primarily realised eschatologically (in heaven), there is no third party to enforce them and future reputational concerns are irrelevant to preventing divine defection. Since the future benefits of faith are not only unenforced and uncertain but realised *post mortem*, this is necessarily a high trust context.⁷

Redefining the trust game for the context of Christian theism requires several distinctions. First, in conventional trust situations there is typically no exposure to risk arising from the uncertainty over the existence of the trusted. However, in the absence of secure proofs for God's existence, this factor cannot be neglected in the decision to trust a divine being as Hebrews 11:6 acknowledges in the epigraph above.

There are therefore two sources of uncertainty over the trust outcome. First, there is non-strategic uncertainty over God's existence. More generally, there is uncertainty not only over whether God exists but also over whether he possesses the ability to keep his promises. If he is less than omnipotent, then the scope of his power may be insufficient to honour his covenant.

Second, and as in the standard trust framework, there is strategic uncertainty over God's behaviour (his type). This is the issue of the moral character of God. There is a risk that God does not keep his promises because he is an unfaithful, capricious, deceitful or vindictive type of deity who declines to reward those who earnestly seek him, or who did not really accomplish for us the work of salvation. The probability p then captures uncertainty over both God's existence and his faithfulness.⁸

In the game tree, it is assumed that the payoff for the person who declines to trust is always equal to S , whatever her beliefs regarding God's existence and faithfulness. The implication is that the non-truster supposes that there are no eternal consequences at all from rejecting faith. Implicitly, she accepts an annihilationist position of no *eternal* punishment (or gain) with respect to her fate if her (*ex ante* rational) decision not to trust proves to be mistaken *ex post*. In other words, the truster thinks that God does not get to move if trust is withheld. There is obvious scope for future extensions of the model to relax this assumption.

It is important to interpret carefully the G and B payoffs. As in the regular trust game, G is the believer's utility if God honours his promises whereas B is interpreted as lifetime utility if God fails to deliver on his word. The New Testament distinguishes two periods: the "now" (the present evil age) of mortal life and the "not yet" (the age to come) of eschatological life. The periods are inter-related since Christians already enjoy a foretaste of the powers of the coming age in the present as they share in the Holy Spirit (Hebrews 6: 4-5). The foretaste includes the spiritual blessings of God's presence, forgiveness, new life and the joy that believers receive in Christ (Ephesians 1:3). All temporal spiritual benefits are included in both G and B . Since

⁷ John Hick (1960, 1977) has pointed out that even eschatologically there is the philosophical problem of how one could know it is God that one encounters, and how God's promises could be irrefutably confirmed.

⁸ Let X be the event that God exists and F the event that God is faithful to his promises. As these events are not independent, $p = \Pr(X \cap F) = \Pr(X)\Pr(F|X)$.

believers already experience these blessings, they are not strictly the object of trust. Rather it is the eschatological gains, variously described as salvation, inheriting the kingdom, the heavenly city, and eternal life with God to which trust relates. It is these additional heavenly benefits that are included in G but not in B . The difference ($G - B$) constitutes the content of Christian hope.⁹ It is the eschatological gain for the truster from God keeping his promises.

Of course, it could be argued that in practice people do not only trust God for life in the age to come but also for temporal blessings in terms of health, wealth, family, and career. However, the expectation of such worldly gains is not easy to justify theologically.¹⁰ In so far as such trust is not based on a divine promise, it is misdirected.

Limiting the gains from trust to the eschatological is consistent with the view of the author of Hebrews (chapter 11) who wrote regarding the great heroes of the Jewish faith:

“All these people were still living by faith when they died. They did not receive the things promised; they only saw them and welcomed them from a distance (verse 13)...they were longing for a better country – a heavenly one (verse 16)...They were all commended for their faith, yet none of them received what had been promised (verse 39).”

It is the unseen, heavenly future to which faith and God's promises are primarily related in the book of Hebrews.¹¹ So the gain for the believer, $G - B$, from God keeping rather than violating his word is treated as thoroughly eschatological.

Notice that this is a model of *one-way* trust. In contrast, Hardin (2002) argues that trust is usually two-way. This is because it most commonly arises in the context of close relationships characterised by frequent interactions rather than in one-shot encounters with strangers. However, the possibility of two-way mutual trust between God and believers raises difficult philosophical issues of divine passibility (whether human actions can impose losses on God) and foreknowledge (whether God is exposed to risk) that are not central to the discussion of faith. Interestingly an example of one-way trust cited by Hardin is the highly asymmetric relationship of a dependent child to its parents. The biblical application of the father-child analogy to God and his people suggests that a one-way trust model may not in fact be inappropriate.

In the non-religious literature, there are two views on the nature of trust that are useful for thinking about faith.

(i) Trust is cognitive: it is a *belief* about the trusted's trustworthiness.

⁹ In previous work, I discuss the compelling reasons for modelling (discounted) eternal gains as a finite rather than an infinite payoff (Smith, 1999; 2000; 2002).

¹⁰ Indeed, I take the extreme claim of the prosperity gospel that God promises treasure on earth to faithful believers to be not only a theological error but also an insult to Christians living in poverty.

¹¹ See also Hebrews 10:36 and 11:40.

- (ii) Trust is behavioural: it is an *action* which, given beliefs, relies on the second mover keeping their promises.

Notice that in the latter case, beliefs function as an input into the trust decision whereas in the former case, beliefs define trust itself. The next step is to examine each position in greater detail, apply it to Christian faith and evaluate its adequacy.

5. Trust as Belief

Many authors characterise trust in terms of the probability (p) that the trusted is trustworthy. In this formulation, trust is a *belief* about someone's trustworthiness. Hardin (2002, p.10), for example, claims that:

'The declarations "I believe you are trustworthy" and "I trust you" are equivalent.'¹²

The value of the probability assessment of trustworthiness measures the degree of trust. The focus of a stream of studies is then to determine what factors ensure high trustworthiness. Candidates discussed include, for example, social norms, legal or informal sanctions, reciprocity, reputation, social distance and moral incentives.

Biblical scholarship gives some encouragement to the identification of trust as trustworthiness, faith as faithfulness. While acknowledging that there is a conceptual distinction, Taylor (2000) argues that this is somewhat ambiguous in scripture. Indeed, the classic definition of faith in Hebrews 11:1 as "being sure of what we hope for" and "certain of what we do not see" appears to support the view of trust as primarily cognitive.¹³ Likewise, the faith of Abraham, the biblical paradigm of a man of faith, is described in terms of considering God faithful with regard to the promise of numerous descendants (Hebrews 11:11).

In Christian philosophical theology, the trust-as-belief approach is mirrored in the treatment of faith as propositional belief. Historically, the Catholic position, following Thomas Aquinas, understands faith as consisting in intellectual assent to divinely revealed doctrines and propositions (Kenny, 1992). In the context of the model, this view of faith is represented by the strength of belief, p , that God exists and possesses particular properties and has done and will do specific actions – the Christian gospel. According to this position, to have more faith in God is to hold stronger beliefs, to have fewer doubts. In other words, faith is fractional. Although the trust participation decision is constructed as a binary choice between trusting or not, the trust-as-trustworthiness approach permits assertions about a person's degree of faith in terms of the magnitude of p . Doubt is then interpreted as $(1 - p)$.

¹² See also Gambetta (1988, p.217), Dasgupta (1988, p.51) and Kreps (1990).

¹³ This is far less clear in some other translations of Hebrews 11:1 such as the King James Version which has, "Now faith is the substance of things hoped for, the evidence of things not seen".

There is naturally considerable debate on the determinants of religious beliefs. Philosophers focus on the extent to which beliefs are evidentially justified or otherwise reasonable.¹⁴ Theologians consider the role of God’s character, reputation and actions in assessing divine trustworthiness. The book of Hebrews itself is concerned to influence the strength of belief by demonstrating that God keeps his word, citing the case of Abraham (6:13-20), and insisting that Christian hope is as firm and secure as an anchor (6:19).

Although a popular conceptualisation, there are problems with defining faith in terms of degree of belief. First, suppose $p = 1$, such that Christianity is assessed as true for sure and God is considered completely trustworthy.¹⁵ Given the elimination of all perceived uncertainty, it is not clear in what sense faith is relevant since it is usually associated with a sense of exposure to risk of loss.¹⁶ However, philosophers who follow Aquinas appear happy to treat faith as a mental state of certain belief. For them, it is akin to knowledge arising from the classical proofs of natural theology that demonstrate God to be a necessary being.¹⁷

Second, it could be that an individual has very strong (but less than certain) beliefs in the truth of Christian doctrine and God’s faithfulness but yet these beliefs are in fact insufficient to induce faith. This can most readily be seen by rearranging the trust condition in equation (1) to put beliefs on the left-hand side. This shows that faith is rational if the strength of belief is sufficiently high

$$p \geq \frac{S - B}{G - B}. \quad (2)$$

Define $p^* = \frac{S - B}{G - B}$ as the minimum value of the probability p that is just sufficient to induce faith. Clearly the magnitude of p^* depends on S , G and B and this can vary across

¹⁴ Helm (2000) distinguishes between the rationality and the justifiability of beliefs. A belief can be rational in so far as it is consistent with a person’s other beliefs and the limited information available to her. However, it may not be epistemically justifiable in terms of all the evidence.

¹⁵ The limiting case of certainty or full assurance of faith seems to be assumed by Calvin in his view that, “we shall possess a right definition of faith if we call it a firm and certain knowledge of God’s benevolence towards us” (*Institutes of the Christian Religion*, III, ii, 7). However, Calvin acknowledges that faith is imperfect, troubled by doubts and unbelief, “Surely, while we teach that faith ought to be certain and assured, we cannot imagine any certainty that is not tinged with doubt” (*Institutes*, III, ii, 17). And again, “in the course of the present life it never goes so well with us that we are wholly cured of the disease of unbelief and entirely filled and possessed by faith” (*Institutes*, III, ii, 18).

¹⁶ Nooteboom (2002, pp.38-41) makes this point regarding the treatment of trust as belief.

¹⁷ The position of Aquinas and some of his modern philosophical followers is discussed in Helm (2000). Against the Thomistic view, Helm argues that the evidence does not permit equating faith with incorrigible knowledge. For him, faith always involves some epistemic risk.

individuals.¹⁸ It is conceivable that a person with strong beliefs declines to trust because potential losses ($S - B$) are high enough such that $p < p^*$. Likewise, someone with weak beliefs may still trust God if the potential gains sufficiently swamp possible losses such that $p \geq p^*$. The point is that there is no necessary direct correlation between degree of belief and the trust decision. Although the empirical relationship is likely to be positive, it is inadequate to define faith only in terms of strength of belief. For the same reasons, it is inadequate to define trust in terms of an assessment of trustworthiness.

Third, as insisted upon long ago, even the demons believe in God (James 2:19) but it seems counter-intuitive to credit demons with faith. The implication is that faith cannot simply be identified with propositional beliefs. An alternative approach is required that has the desirable property of permitting even the devils to believe but without manifesting faith.

The notion is widespread that authentic faith calls forth commitment and practise. It involves entrusting oneself to divine promises and participating in the rites, rituals and institutions of a religion as well as obeying its behavioural norms and duties. In other words, trust involves action. It is a practical decision and not simply an epistemic attitude regarding probabilities.

6. Trust as action

In the trust literature, the main alternative position to the view that trust is a matter of belief regarding trustworthiness, is that trust is behavioural, an action that risks squandering resources if trust is violated. As such trust involves giving up a sure thing with a certain value ($S - B > 0$) in exchange for an expected future benefit $p(G - B)$.¹⁹ The degree of trust is measured not by strength of belief p but by the loss experienced if trust is exploited by the trusted, namely $S - B$. In standard trust game experiments, subjects are typically endowed with a given monetary amount (a fixed value for S) and choose how much to transfer to another player. In other words, the first mover's choice of B determines the level of trust, $S - B$.²⁰

In Christian theology, the trust-as-action approach is mirrored in the treatment of faith as relying on God or commitment to God. For the Lutheran tradition, propositional belief is necessary but insufficient for faith. Faith is not merely believing that something is true but acting on that belief on the basis of the trustworthiness of God's promises and saving purposes. In

¹⁸ Accepting the conventional trust game payoff ordering that $G > S > B$ then p^* is increasing in S and decreasing in G and B .

¹⁹ This definition is adopted by, for example, Bacharach and Gambetta (2001), Coleman (1990, pp.98-99) Snijders and Keren, (1999, p. 374) and McCabe, Rigdon and Smith (2003, p.267). The trust as action position is sometimes more generally stated as voluntarily placing control over an outcome or resources at the disposal of the trusted, as an act of giving discretion to another to affect one's own interests.

²⁰ The transfer is then typically multiplied in size by the experimenter and the second mover selects how much, if any, of the multiplied transfer to allocate to the first mover.

Hebrews 11, for example, the great heroes of faith, the cloud of witnesses (12:1), are commended for their costly yet faithful deeds. Abel offered God a better sacrifice than Cain (11:4), Noah built an ark (11:7), Abraham left his country (11:8) and offered Isaac (11:17), Moses chose to be ill-treated (11:25) and others suffered variously under persecution (11:35-38).²¹

According to the trust-as-action position then, to have more faith in God is to act so as to expose oneself to greater losses if heaven is a fiction. On this interpretation, faith is equivalent to a risky reliance investment of time, effort and money whose return is eschatological. On this view, faith is a commitment in the sense that it is an irreversible cost.

Letting $r = S - B$, the potential loss from reliance on God keeping his promises, the condition for rational faith can be restated as

$$p(G - B) \geq r. \quad (3)$$

The term $p(G - B)$ is a measure of the expected eschatological benefit from reliance investment. The maximum an individual would be willing to rely on God is given by $r^* = p(G - B)$. Clearly r^* is increasing in the strength of beliefs p . For a radical sceptic who completely rejects Christian belief $p = r^* = 0$ and no trust is invested in God. More generally, if required reliance is too high ($r > r^*$), then faith is declined.

With respect to the demons, the trust-as-action view permits them to believe in God and his trustworthiness, even with complete certainty $p = 1$, but not to have faith if $S > G$ since then $r > r^*$. Theologically, the interpretation is simply a matter of tastes rather than beliefs. The demons prefer their darkness and its perverse pleasures (S) to the light and eternal life with God (G), a preference ordering that notably violates the usual assumption of the trust game in which $S < G$.

It is important to notice that religious observance, although it imposes an opportunity cost, does not necessarily require that the condition for faith in (3) is satisfied. For there are benefits from involvement in religious institutions available to those with no belief in the ancient creeds ($p = 0$). Contributions of time, money and effort to religious activities can be rational in terms of the purely secular gains they generate. An individual, for example, may value the social role of the church in the local community or perceive it as a beneficial source of moral education or appreciate the aesthetics and emotions of worship or gain from friendship, mutual assistance, and singing in the church choir. All of these benefits can have a positive net effect on the no-trust payoff S and are independent of faith in so far as they do not rely on God keeping his promises.

For trust-as-action to exist then, it is not simply that costly actions are incurred. According to the model, the cost of an individual's participation in the Christian life must exceed any this-worldly benefits for authentic faith to be exercised. In other words, a person's

²¹ In addition, James 2:26 teaches that faith without deeds is dead, to quote an epistle of which Luther ironically did not approve, describing it as "full of straw".

investment must be vulnerable to the risk of loss from God failing to perform; S must exceed B . The actions that constitute faith increase reliance $r = S - B$ by adversely affecting utility if trust is exploited, B .

It could be objected that the faith as action approach appears to treat faith as an unaided human achievement. This would conflict with the Reformed strand of Protestant thought which insists that faith itself is a gift of divine, received rather than achieved (Ephesians 2:8-9). In its strongest form, the tradition asserts that God by his Spirit irresistibly yet graciously induces those individuals predestined for salvation to receive faith. The theological motivation for this view is to support the notion that God is active and humans are passive in salvation and that God provides everything necessary (McGrath, 1994).

With respect to the model, one way of thinking of the Reformed view is that faith is a divine endowment. God ensures that his people have a configuration of parameters governing beliefs p and payoffs (G, S, B) that is faith inducing. The emphasis is on the divine determination of these parameters such that it is rational to rely on God's promises.

7. Theological Applications

Faith, salvation and apostasy

If God is faithful to his promises, the eternal benefit of faith, whether defined in terms of belief or action or both, is that of salvation (Hebrews 1:14; 2:3; 5:9; 9:28). This raises the question of whether there is a minimum level of faith necessary for salvation. It is notable that, throughout the New Testament, the degree of faith that constitutes saving faith is left undefined. A Reformed response already alluded to above is simply to say that the question is irrelevant since God endows his people such that their faith is sufficient. Nevertheless, it is clear that certain behavioural patterns can lead to salvation being forfeited by those who "fall away" (Hebrews 6:4-6). Those who shrink back are destroyed (10:39), burned like worthless thorns and thistles (6:8).²² Paradigmatic examples in Hebrews include the wilderness generation that Moses led out of Egypt and who never entered God's rest, the promised land of Canaan, but rather died in the desert because of their sin, disobedience and unbelief (3:16-19). Likewise, Esau godlessly sold his inheritance rights for a single meal. Later when he wanted to inherit the blessing, he was rejected (12:16-17).

Heavenly benefits then are a club good in that although they are non-rival in consumption, they are finally excludable to those who do not endure in faith, who do not run the race with perseverance (12:2). This requires modification of the model to recognise that the trust decision of Christian faith is not in practice a one-off choice but rather a stage of the game that is

²² The passage in Hebrews 6 is controversial since it appears to be in tension with the doctrine of a believer's eternal security. However, as deSilva (2000, p.249) points out, it is important that theological presuppositions do not prevent us recognising that, "The text assumes the possibility that a person can fall away after receiving God's gifts, and after participating as fully as anyone can in what blessings of the next age are open for our experience in this age". See also, Schenck (2003, chapter 4).

repeated throughout life. Individuals who initially choose faith may fall away as circumstances change and vice versa. The recipients of the letter to the Hebrews, for example, at one time experienced persecution in the form of public insult (10:33), imprisonment and confiscation of property (10:34). In terms of the model, unanticipated persecution has an adverse, exogenous impact on the lifetime payoff available to a truster. Suppose the cost of persecution is given by b , then the minimum cost of relying on God is $S - b$.²³ Those individuals for whom the resulting price of suffering is too high will lose faith. Even though initially $r > r^*$, if the persecution shock pushes b sufficiently low such that $p(G - b) < (S - b)$ then faith is no longer rational. The sense then in which persecution tests faith is that people with beliefs and payoff that only support a low maximum level of reliance are more likely to backslide in a hostile context.

As already stated, there is no unambiguous specification in Hebrews or elsewhere of the boundary between apostasy and fidelity. One possible explanation is that too precise a definition of this threshold would provide an incentive simply to choose the minimum acceptable level of faith, and so become “lazy” (6:12). Instead the minimum is left uncertain, a device which functions to induce much higher levels of “work” (6:10) and “diligence” (6:11), solving the motivation problem. The text recognises that sinful believers need to be exposed to some risk if they are to have strong incentives to “imitate those who through faith and patience inherit what has been promised” (6:12). In other words, there is a trade-off between incentives and full eternal insurance. Uncertain standards have the desirable consequence of fostering faith by only partially insuring believers (Craswell and Calfee, 1986).

Faith and heavenly rewards

In the model, utility if God honours his promises, G , is written down as independent of the extent of reliance. However, there are passages in scripture which can be taken to suggest special rewards for those who serve the Lord meritoriously (1Corinthians 3:14; Ephesians 6:8; Colossians 3:24; Matthew 5:12). In terms of the model, this would imply that $G = G(r)$ where greater faith is assumed to increase the magnitude of eternal benefits. However, it is difficult to specify a functional form since the Bible is vague on the extent to which more worldly sacrifice is recognised by additional heavenly reward.

Faith and love for God

In the standard one-way trust game, it is implicitly assumed that the truster does not care about the welfare of the trusted. First mover trust is self-regarding in that it is motivated by the anticipated actions of the second mover. This property carries over into the model of faith since, on the reliance view, faith is conditioned on the expected eschatological gains for the believer.

However, discipleship may be motivated by love for God and God’s glory rather than heavenly benefits, G . In other words, believers typically care about pleasing God; they possess

²³ An enforced reduction in B will raise the potential loss $S - B$ by more than the increase in the expected eschatological gain $p(G - B)$ as long as $p < 1$. Marginal believers for whom the trust condition is barely satisfied will naturally be the first to fall away when suffering comes.

altruistic God-regarding preferences. While Christian love shares similar consequences to trust-as-action in terms of resource allocation, it is analytically different from trust. For trust can occur even if God's pleasure does not enter the disciple's utility function and love for God can be expressed independently of any divine promises. Nevertheless in general it is likely that love and trust are positively correlated (Cox, 2004) and a richer model of Christian motivation would surely want to incorporate love of God.

8. Concluding Comments

This paper is a contribution to the new field of rational choice theology. It has attempted to show that the modified trust game provides a precise model for thinking about faith as a form of conditional cooperation with God. The debate in the economic and philosophical literature over whether trust is a belief or an action quite nicely parallels the two main views of the nature of faith in the Christian tradition. Although a degree of ambiguity over the definition of faith is reflected in scripture itself, here the trust-as-action view is the preferred approach: given beliefs, faith is defined as an action that relies on God keeping his word. Faith then inevitably involves both cognitive and volitional elements.

The study focuses only on the conditions that must be satisfied for faith to be rational. A natural extension is to investigate the determinants of the optimal degree of faith. In addition, a possible next step is to apply the model to one of the major contemporary controversies in New Testament studies, namely the issue of covenantal nomism and the interpretation of the justification in Galatians and Romans, the faith and works debate.

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