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What Your Face Says: How Signals of Communion and Agency Inform First Impressions and Behavioural Intentions

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ABSTRACT

Two studies investigated how facial signals of communion and agency intersect to shape first impressions. Study 1 primarily investigated how enhancing or reducing facial signals of communion or agency affected impressions of these dimensions. Results demonstrated that the manipulation of facial signals of communion affected impressions of both communion and agency, whereas the manipulation of facial signals of agency affected only impressions of agency. Secondly, data from Study 1 were used to categorize the Basel Face Database stimuli into the four cells of the stereotype content model (SCM). Study 2 investigated how combined facial signals of communion and agency impact individuals' evaluations, emotions and behavioural intentions towards targets. Results showed that communion signals in faces have a stronger impact on overall evaluations and behavioural intentions compared to agency signals. Furthermore, in line with the SCM, specific combinations of communion and agency evoked distinct emotions: admiration (high communion–high agency), pity (high communion–low agency) and contempt (low communion–low agency). Together, the research emphasizes the primary role of communion in social perception, highlighting theoretical and practical implications.

1 | Introduction

Imagine going to a speed dating event. You look around and observe the unfamiliar people around you. You are likely to spontaneously form a first impression of these people based on their facial features (e.g., their smile and jawline; see Oosterhof and Todorov 2008). From these facial signals, you form an initial judgement about whom you might befriend (i.e., those high or low in communion) and whom you might seek expert advice (i.e., those high or low in agency). One question arising from such a process is whether the facial signals of communion and agency influence impressions on only one dimension or whether they affect both dimensions. For example, do signals of communion affect only judgements of a target's communion or do they also affect judgements of the target's agency? A second important question concerns the extent to which facial signals of communion and agency influence how people form overall impressions of others, the emotions they experience towards others and behavioural intentions towards them. For example, do facial signals of communion or agency show a greater impact on how we evaluate and seek to interact with others? The present research addresses these questions.

1.1 | Studying Communion and Agency in Social Perception

Extensive research has shown that our first impressions of others are centred around two global social dimensions. While these dimensions have been referred to under varying names and have been defined somewhat differently, they share much common content (see Abele and Wojciszke 2007; Abele et al. 2021 for a review). Here, we refer to these dimensions as *communion* and *agency*, aligned with Bakan's (1966) conceptualization of two fundamental modes of human existence. Communion comprises characteristics that are related to forming and maintaining social connections (also referred to as warmth or nurturance; e.g., Abele and Wojciszke 2007; Fiske, Cuddy, and Glick 2007; Ybarra, Chan, and Park 2001), whereas agency comprises characteristics aimed at pursuing personal goals and manifesting skills and accomplishments (also referred to as competence or dominance). According to a functional interpretation of these classes of information (Abele and Wojciszke 2007, 2014; Fiske, Cuddy, and Glick 2007), when an individual meets a new person, they want to know the person's intentions—that is, whether they represent an opportunity or a threat (communion) and their capability — that is, whether or not they are able to put their intentions into action (agency).

Inferences about a target's communion and agency are derived from many sources, including the target's facial features (see, e.g., Ballew and Todorov 2007; Imhoff et al. 2013; Oosterhof and Todorov 2008; Willis and Todorov 2006). At an experimental level, faces can be classified and organized in a multidimensional perceptual *face space*, where every face is mentally represented as a specific point according to perceptual dimensions (Valentine 2002). The face space has been used to describe the physical features underlying specific inferences about social dimensions (e.g., Stolier et al. 2018; Todorov, Baron, and Oosterhof 2008; Walker and Vetter 2009, 2016). For example, Todorov, Baron, and Oosterhof (2008) found that the two most important dimensions in face space tap trustworthiness and dominance. The first dimension refers to the quality of people to be reliable in their intention and is conceptually analogous to communion, whereas the latter dimension refers to the capability to be strong and is aligned with the agency dimension (see also Rule and Ambady 2011; Rule et al. 2013; Zebrowitz and Montepare 2005).

To begin to study different aspects of social perception from observations of a face, databases were developed containing images of faces manipulated to elicit a differential impression of communion and agency (Oosterhof and Todorov 2008; Ramos et al. 2016; Todorov et al. 2013). First attempts included artificial computer-generated facial stimuli that differed only on facial information relevant to the dimension of interest (e.g., trustworthiness; Todorov, Baron, and Oosterhof 2008). Building upon these efforts, Walker et al. (2018) developed a new and sophisticated database—the Basel Face Database (BFD)—with images of 40 different individuals, all subtly and systematically manipulated to highlight variations in facial features signalling communion and agency (see Figure 1 for images of a single target with reduced and enhanced signals of communion and agency). In the morphable approach of the Basel face model, the specific facial features signalling communion and agency were not defined in a top-down (theory-based) approach but identified in a bottom-up (data-based) manner (Walker and Vetter 2016). The facial characteristics that were associated with perceptions of communion and agency by participants of a previous study were modelled, that is, enhanced or reduced in the database faces (see Walker and Vetter 2016; Walker et al. 2018 for more details). Compared to previous databases that were devoid of extra-facial features, such as hairstyle (e.g., Todorov et al. 2013), the BFD consists of real (i.e., not computer-generated), authentic faces of young men ($n = 18$) and women ($n = 22$) with an average age of approximately 23 years.

Regarding the physical features underlying the perception of communion and agency in the BFD, Walker and Vetter (2016) noticed that these perceptions derived from a combination of the configuration of facial features and reflectance (see also Walker and Vetter 2009). For instance, a configuration of the mouth that resembles a smile combined with an intense brightness of the face signals enhanced communion. Conversely, a pronounced forehead combined with marked skin colours signals high agency.

The BFD has demonstrated strong psychometric properties in the evaluation of communion and agency (e.g., Formanowicz et al. 2018; Rudert et al. 2020). Specifically, research has demonstrated that manipulating a face to enhance its level of communion or agency leads to higher (i.e., more positive) judgements on the respective social dimension (compared to the original version of the face) while manipulating a face to reduce the level of communion or agency leads to lower (i.e., more negative) judgements on the respective social dimension. Because of these characteristics, the BFD represents an important innovation and a useful tool for research in the field of social perception, allowing for the test of novel questions about the perception of communion and agency in faces.

1.2 | The Primacy of Communion Over Agency

Given the pivotal role of communion and agency in social perception, it is of fundamental importance to understand how they relate to each other. In this regard, a wide literature has shown that communion-related traits attract more attention and influence more elaborative processing relative to agency-related traits (Wentura, Rothermund, and Bak 2000; Wojciszke, Bazinska, and Jaworski 1998; Ybarra, Chan, and Park 2001). As one example, Wojciszke, Bazinska, and Jaworski (1998) conducted a series of studies demonstrating the primacy of communion over agency signals in social perception. Firstly, they found that when participants listed the most important traits of a target, participants spontaneously listed more communion (e.g., sincere, honest, cheerful and loyal) than agency (e.g., intelligent, industrious, competent and skilful) traits. Secondly, these researchers found that participants selected significantly more communion than agency traits when they were asked to select traits that would help them to decide whether a target warranted a positive evaluation.

Abele and Bruckmüller (2011) explained the heightened role of communion over agency by noting that understanding whether someone's intentions are beneficial or harmful matters more to

FIGURE 1 | An example of an original face (middle) and versions with reduced (left) and enhanced signals (right) of communion (top) and agency (bottom). *Source:* Basel Face Database (https://bfd.unibas.ch/en/).

survival than understanding whether their intentions are aimed at achieving their goals (Peeters 2002). Beyond this explanation, communion impressions, more than agency impressions, determine approach—avoidance behavioural intentions during interpersonal encounters (Fiske, Cuddy, and Glick 2007; Peeters 2002). Thus, communion assessments appear to be primary at least from the observer's perspective (Wojciszke 2005). Additionally, research has demonstrated enhanced cognitive accessibility of communion information relative to agency information. For example, in lexical decision tasks, perceivers identified communion-related words faster than agency-related words, even when controlling for word length (Ybarra, Chan, and Park 2001).

Regarding facial signals (the focus of the present article), it has been found that people perceive communion more accurately and quickly than agency, even with a brief exposure time (100 ms; Willis and Todorov 2006). Another series of studies confirmed that perceivers judged communion faster than agency, using an anticipated interaction paradigm and a photo evaluation task without contextual cues (Hack, Goodwin, and Fiske 2013). Furthermore, Todorov, Pakrashi, and Oosterhof (2009), using a priming paradigm, showed that the effect of facial signals of communion could be observed even when the face was presented below the threshold of subjective awareness.

In sum, a wide literature has shown that in both trait descriptions and face exposure, communion signals are primary over those of agency in forming impressions of others. It is worth noting, however, that in some circumstances, agency signals can be more

important than communion signals (Fiske, Cuddy, and Glick 2007). For example, an agency can have a stronger effect when people evaluate themselves and closely relate to others compared to when they evaluate strangers (Abele and Wojciszke 2007; see also Abele et al. 2021, for a review). Further, Formanowicz et al. (2018) found that facial signals of agency mattered more than facial signals of communion when it comes to the evaluation of others' humanness.

One important question that arises from the complex relationship between communion and agency is whether communion and agency signals, *in isolation*, are used to infer an impression on the other dimension. In this regard, research by Li et al. (2020) showed that when individuals were first presented with a target's communion traits, they also made inferences about the target's perceived agency. However, when individuals were first presented with a target's agency traits, no systematic inferences were made about the target's communion. This suggests that perceivers use communion-trait descriptions to infer information about a target's agency, but not vice versa, consistent with the primary role of communion over agency. That said, Imhoff and Koch (2017) found that agency information influenced inferences of communion in a curvilinear manner: perceptions of communion peaked at average levels of agency, while targets high or low on agency were perceived as low on communion. The authors concluded that the influence of communion on agency (or vice versa) may depend upon the information available at the time of the evaluation and the demands of the evaluative context (e.g., work context, friendship context).

Integrating the literature reviewed above, one aim of the present research was to assess whether people make inferences about both social dimensions or only about the manipulated social dimension when they are presented with a high (vs. low) face in communion *or* agency (*Research Aim 1*, Study 1). We reasoned that when evaluating an unfamiliar target, communion is likely to play a predominant role, given that this dimension is more accessible than agency in facial evaluations of strangers (Willis and Todorov 2006). Consequently, we hypothesized that differences in facial signals of communion (i.e., high vs. low) would impact both communion and agency impressions, whereas differences in facial signals of agency (i.e., high vs. low) would impact only agency impressions (*HP1*). If confirmed, this hypothesis would have relevant theoretical implications. Indeed, in the development of the BFD, communion and agency vectors were almost orthogonal, and communion and agency impressions of faces were uncorrelated (Walker and Vetter 2016). However, when these vectors are applied to novel faces and we ask participants to form an impression of an unknown target, the impressions are no longer uncorrelated, because communion impacts impressions of communion and agency, but not vice versa.

1.3 | Combining Communion and Agency in a Face

In addition to understanding the degree to which people use facial signals of communion to infer agency (and vice versa), there is another important issue that derives from the intersection of communion and agency perceptions. Within the stereotype content model (SCM; Fiske 2012;[1] Fiske et al. 2002), communion and agency dimensions are crossed in a two-by-two matrix, resulting in four cells: high communion–high agency, low communion–low agency, high communion–low agency and low communion–high agency. More specifically, research has revealed that some social groups (e.g., middle-class people) are evaluated high (or low, e.g., homeless people) on both dimensions, while other social groups elicit ambivalent impressions, being evaluated high on one dimension and low on the other dimension (e.g., the elderly are seen as high on communion and low on agency, whereas rich people are seen as low on communion and high on agency; see Fiske et al. 2002; Fiske, Cuddy, and Glick 2007). While several authors have shown that univalent and ambivalent impressions are present for groups and individuals (including the self; Abele et al. 2016; Russell and Fiske 2008; Wojciszke, Abele, and Baryla 2009), FiskeCuddy, and Glick (2007) noted that when individuals judge other individuals (vs. groups), univalent impressions are more frequent than ambivalent impressions, in line with a so-called halo effect (see also Judd et al. 2005).

As mentioned above, in the original BFD development, communion and agency vectors were almost orthogonal, and communion and agency impressions from faces were almost uncorrelated (Walker and Vetter 2016). Moreover, faces were manipulated on a single dimension, not on several dimensions (i.e., both communion and agency) simultaneously. This, however, does not mean that the resulting database faces are perceived as neutral on all but the manipulated dimensions because the original images were not 'neutralized' regarding personality impressions. Thus,

every face provides information individuals can use to form communion and agency impressions. The combined impression may reflect any combination of communion and agency in accordance with the above-mentioned 2 × 2 SCM (e.g., Fiske, Cuddy, and Glick 2007). Accordingly, we reasoned that the BFD should consist of faces perceived as high communion–high agency, low communion–low agency, low communion–high agency, and low communion–high agency. With this in mind, we aimed to place the BFD faces into the 2 × 2 SCM typology based on the impressions they evoke: faces perceived as high communion–high agency or low communion–low agency being placed in the univalent SCM cells, faces perceived as high communion–low agency or low communion–high agency being placed in the ambivalent SCM cells (*Research Aim 2*, Study 1). As a consequence of the halo effect, participants should form more univalent impressions than ambivalent ones; therefore, we expected to find a greater number of faces in the univalent cells compared to the ambivalent ones (*HP2*).

1.4 | Communion, Agency and Evaluations of Targets

Research has demonstrated that perceptions of a target's communion and agency shape overall evaluations, with communion being more strongly linked to positive favourability than agency (Kervyn, Fiske, and Yzerbyt 2013; Suitner and Maass 2008). This association suggests a significant overlap between favourability and communion. In the face perception domain, Oosterhof and Todorov (2008) postulated that favourability and communion can be used interchangeably as interpretations of the same primary dimension of face evaluation. More recently, Oliveira et al. (2020) demonstrated that relations among communion, agency and favourability may differ when considering trait descriptions or facial signals. Specifically, across three studies Oliveira et al. (2020) found a linear relationship between communion and favourability in both trait descriptions and face evaluations. In contrast, they found a quadratic relationship between agency and favourability in trait descriptions and a negative linear relationship between agency and favourability in face evaluations. More extreme agency trait descriptions (e.g., very dominant or very submissive) lead to lower favourability ratings than moderate agency trait descriptions, while higher agency signals in faces led to lower favourability ratings than lower agency signals.

In their study, Oliveira et al. (2020) used a subset of faces adapted from the original database by Oosterhof and Todorov (2008), such that participants rated communion and agency separately on a continuum from very low to very high. But what happens when people look at a face conveying *combined* high (vs. low) communion and high (vs. low) agency (*Research Aim 3*)? In the present research, this question seeks to offer novel insights regarding relations among communion, agency and favourability (e.g., Bruckmüller and Abele 2013). From a practical perspective, one outcome of this process is the opportunity to understand how people evaluate a target expressing conflicting facial signals of communion and agency.

Given previous research about the importance of communion, we reasoned that when communion and agency are combined in

the same face, communion signals should have a stronger impact on the overall evaluation relative to agency signals (Oosterhof and Todorov 2008). With this in mind, it is reasonable to expect that, regardless of the level of agency signals in a face (i.e., enhanced or reduced), participants should express a positive judgement towards a face with high levels of communion and a negative judgement towards a face with low levels of communion. As a consequence, we hypothesized that participants should report higher (i.e., more positive) judgements towards individuals with communion-enhanced faces (i.e., univalent positive: high-communion–high agency; ambivalent: high-communion–low agency) compared to individuals with communion-reduced faces (i.e., univalent negative: low communion–low agency; ambivalent low communion–high agency, *HP3*).

1.5 | Communion, Agency and Emotions

Beyond affecting the favourability of global evaluations, communion and agency signals can influence emotional responses perceivers link with a target. According to the SCM (Fiske et al. 2002; Fiske, Cuddy, and Glick 2007; see Abele et al. 2021, for a review), each combination of communion and agency evokes different emotions. Specifically, high communion–high agency evokes admiration, high communion–low agency evokes pity, low communion–high agency evokes envy, and low communion–low agency evokes contempt. Starting from this premise, in the present research we also investigated the emotions evoked by the combination of communion and agency signals in BFD faces (*Research Aim 4*, Study 2). We hypothesized that (a) high communion–high agency faces should evoke greater admiration compared to the other three categories of faces, (b) low communion–low agency faces should evoke greater contempt compared to the other three categories of faces, (c) high communion–low agency faces should evoke greater pity compared to the other three categories of faces and (d) low communion–high agency faces should evoke greater envy compared to the other three categories of faces (*HP4*).

1.6 | Communion, Agency and Behaviour

In addition to assessing the impact of communion and agency on evaluations and emotions, research has also assessed their impact on guiding behaviour. Consistent with work demonstrating the relative importance of communion over agency (Wentura, Rothermund, and Bak 2000; Wojciszke, Bazinska, and Jaworski 1998; Ybarra, Chan, and Park 2001), evidence has shown that when both communion and agency information are available to perceivers, communion information has a greater influence in guiding behaviour, specifically in terms of approach versus avoidance (Brambilla et al. 2013; Van der Lee et al. 2017; Van Prooijen and Ellemers 2015). The SCM (Fiske et al. 2002; Fiske, Cuddy, and Glick 2007) has shown similar effects and postulates that communion signals promote active and impactful behaviour towards targets, whereas agency signals predict passive behaviour towards targets.

It is worthwhile noting that, in some circumstances, agency signals can be more important than communion signals in driving behaviours (Fiske, Cuddy, and Glick 2007). More specifically,

according to the pragmatic diagnosticity hypothesis (Kenny et al. 1994; Koch et al. 2020; Yzerbyt 2018; Yzerbyt and Cambon 2017), agency tends to be more evidence-based, consensual and stable across time and contexts compared to communion (Kenny et al. 1994; Koch et al. 2020; Yzerbyt 2018; Yzerbyt and Cambon 2017). As a result, information about agency is more likely than information about communion to be readily available and offer some reliable basis to evaluate targets and drive behavioural intentions. In a recent review, Abele et al. (2021) harmonized these contrasting perspectives, underlining the importance of moderators. According to the authors, agency signals seem to be prioritized when a comparative context is activated and when the self is implicated in the evaluation.

Building upon this evidence, in the present research we tested behavioural intentions towards—BDF faces depending upon their levels of communion and agency (*Research Aim 5*, Study 2). We reasoned that when perceivers have only facial information available, the valence of communion signals should predominate in guiding behavioural intentions towards the target. Consequently, we hypothesized that participants should be more willing to approach individuals with communion-enhanced faces (high communion–high agency, high communion–low agency) relative to individuals with communion-reduced faces (i.e. low communion–high agency; low communion–low agency, *HP5*). We anticipated that this should occur across different social contexts (work, social).

2 | Overview of the Present Research

The present research tested novel questions regarding how people perceive and react to individuals as a function of their communion and agency facial signals. Two studies were carried out to address our research questions. In Study 1, we aimed to confirm that communion signals are primary over agency when forming a global evaluation of others (Research Aims 1 and 2). In Study 2, we investigated the favourability judgements, emotions and behavioural intentions towards a subset of univalent and ambivalent faces (Research Aims 3–5), using SCM classifications of faces that emerged from Study 1.

3 | Study 1

Study 1 had two overarching aims. First, we assessed whether people make inferences about both social dimensions or only about the manipulated social dimension when they are presented with a high (vs. low) face in communion *or* agency. We hypothesized that differences in communion facial signals (i.e., high communion vs. low communion) should impact both communion and agency judgements, whereas differences in agency facial signals (i.e., high agency vs. low agency) should impact only agency judgements (*HP1*).

Second, this study aimed to place the BFD faces in the SCM cells based on the impressions they evoke: faces perceived as high communion–high agency or low communion–low agency were placed in the univalent SCM cells, whereas faces perceived as high communion–low agency or low communion–high agency were placed in the ambivalent SCM cells (*Research Aim 2*).

As a consequence of the halo effect, participants should form more univalent impressions than ambivalent ones; therefore, we expected to find a greater number of faces in the univalent cells compared to the ambivalent ones (*HP2*).

4 | Method

4.1 | Participants

Based on previous studies (e.g., Walker and Vetter 2016), we reasoned that the same number of participants would be sufficient to replicate findings with similar power. Consequently, our sample consisted of 160 Italian students (80 women and 80 men; *mean age:* 21.36, *SD* = 2.47), all of whom were right-handed, had normal or corrected-to-normal vision and reported no history of neurological or psychiatric disease. Participants were volunteers, and no incentive was given. All participants provided written informed consent in compliance with the Helsinki Declaration and the European Regulation UE n.679/2016. The research was conducted in accordance with the Research Code of the Italian Association of Psychology.

4.2 | Procedure

To ensure that participants were not exposed to any noise or distraction, the experiment was run in the lab, with a PC desktop by using E-Prime software. Participants were positioned 1 m away from a 1.32-m monitor. All participants were presented with four different versions of all 40 BFD faces (160 faces in total) in a within-participant design. The four variants (low/high communion and low/high agency) of the same face were always presented consecutively, with the presentation order counterbalanced across participants. Each face was displayed for 3 s, during which participants were asked to evaluate both the face's communion and the face's agency (see below for details). The order of these items was counterbalanced across participants.

4.3 | Materials

4.3.0.1 | Basel Face Database. We used four different versions of each of the 40 BFD faces for a total of 160 faces. As mentioned above, in the morphable approach of the Basel Face Model, the authors did not specifically change specific features in the faces in a top-down manner, rather, it was done in a bottom-up (i.e., data-based) manner (Walker and Vetter 2016).

4.4 | Measures

4.4.0.1 | Communion and Agency Impressions. Participants' impressions of the communion and agency of each face were measured by asking participants to press buttons to increase (right button press with the right middle finger; maximum = 7) or decrease (left button press with the right index finger; minimum = 1) responses from the starting value of 4 that appeared on the screen in a 7-point Likert scale (1 = *Not at all communal/agentic* to 7 = *Very Communal/Agentic*). To ensure
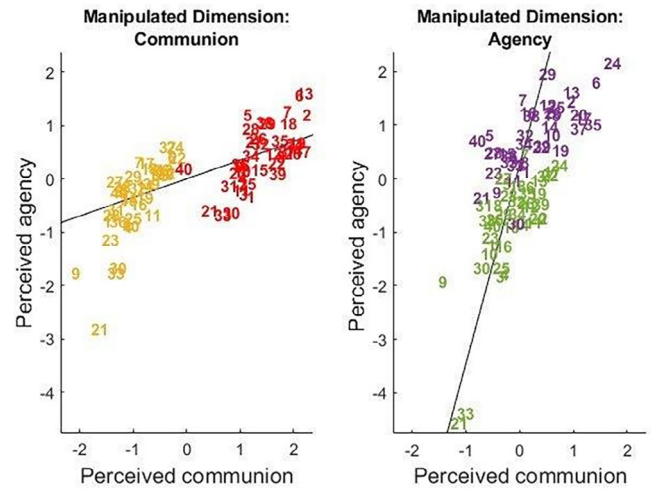

FIGURE 2 | Communion and agency impression for communion and agency manipulated faces (red: communion enhanced; yellow: communion reduced; purple: agency enhanced; green: agency reduced).

that participants had similar concepts in mind while answering these questions, participants were given a definition of both communion (being sociable and warm with others) and agency (being efficient and competent).

5 | Results

We tested HP1 (i.e., communion facial signals should impact both communion and agency impressions, and agency facial signals should impact only agency impressions) using a structural equation model and inserting communion and agency impressions as latent variables in the model. The level of the stimuli regarding the manipulated dimensions (i.e., high communion, low communion, high agency and low agency) were dummy-coded; therefore, the regression parameters represent the average level of those dimensions for the different types of images. Analyses were based on Bayesian inference. As estimates of statistical significance, credibility intervals were computed (see the Supporting Information for details about the statistical model). Bayesian analysis does not base decisions on error control. Indeed, Bayesian analysis does not rely on sampling distributions. Instead of using error rates, Bayesian decisions are based on properties of the posterior distribution on parameter values. Consequently, Bayesian estimates are less sensitive to sampling distribution than frequentist methodologies (see Kruschke and Liddell, 2017, for a review).

Figure 2 shows the latent variable scores (i.e., communion and agency impressions) assigned to the four different versions of each of the 40 BFD faces. The left part of the figure reveals that the differences in facial signals of communion (i.e., high vs. low) impacted both communion and agency impressions. Communion-enhanced faces (i.e., those with red numbers) elicited higher communion and higher agency scores than communion-reduced faces (i.e., those with yellow numbers), whereas the right part of the figure reveals that differences in agency facial signals (i.e., high vs. low) only impacted agency

TABLE 1 | Mean posterior estimates and 95% CI of the latent feature for the different image types.

Typologies of images	Perceived communion		Perceived agency	
	Mean	95% CI	Mean	95% CI
Communion-enhanced faces	1.25*	[0.95, 1.58]	0.44*	[0.11, 0.75]
Communion-reduced faces	−1.09*	[−1.39, −0.77]	−0.37*	[−0.68, −0.05]
Agency-enhanced faces	0.13	[−0.21, 0.44]	0.78*	[0.47, 1.10]
Agency-reduced faces	−0.28	[−0.59, 0.04]	−0.83*	[−1.15, −0.53]

Note: *Significant at 95% CI.

impressions. Agency-enhanced faces elicited higher agency scores than agency-reduced faces.

These results are confirmed by mean comparisons in which communion and agency impressions are compared with zero (i.e., the mean of the two latent variables). Such an analysis (see Table 1) showed, as expected, that communion-enhanced faces were perceived as high in communion ($M = 1.25$, 95% credible intervals (CI) [0.95, 1.58]), whereas communion-reduced faces were perceived as low in communion ($M = −1.09$, 95% CI [−1.39, −0.77]). Crucially, differences in communion facial signals conveyed information that impacted agency impressions. Communion-enhanced faces were perceived as high in agency ($M = 0.44$, 95% CI [0.11, 0.75]), whereas communion-reduced faces were perceived as low in agency ($M = −0.37$, 95% CI [−0.68, −0.05]).

Turning to agency, as hypothesized, differences in agency facial signals only impacted impressions on that dimension. Agency-enhanced faces were perceived as high in agency ($M = 0.78$, 95% CI [0.47, 1.10]), whereas agency-reduced faces were perceived as low in agency ($M = −0.83$, 95% CI [−1.15, −0.05]). In line with our HP1, the agency-enhanced and agency-reduced faces were not perceived as differing in communion, given that their means did not significantly differ from zero on the communion latent dimension, $M_{agency-enhanced} = 0.13$, 95% CI [−0.21, 0.44]; $M_{agency-reduced} = −0.28$, 95% CI [−0.59, 0.04], and their means did not differ from each other, as the CI of the agency face overlapped on the perceived level of communion, 95% CI [−0.41, 0.24].

Taken together, these findings confirmed our HP1, showing that differences in facial signals of communion impacted both communion and agency impressions, whereas differences in facial signals of agency impacted only agency impressions.

As for our second objective—classifying BFD faces across quadrants of the SCM—we used participants' communion and agency impressions to locate BFD faces in one of the four SCM cells. Specifically, Bayesian posterior estimates (compared to zero) on

TABLE 2 | Number of BFD stimuli for each cell of the SCM categories.

	High communion	Low communion
High agency	36 (27 women, 9 men)	7 (3 women, 4 men)
Low agency	3 (1 woman, 2 men)	30 (10 women, 20 men)

the communion and agency dimensions were used to classify faces. Faces with high (or low) averages on both dimensions were classified as univalent (e.g., high communion–high agency; low communion–low agency), whereas faces with a high value on one dimension and a low value on the other dimension were classified as ambivalent (e.g., high communion–low agency; low communion–high agency). Although the original BFD images were not 'neutralized' on communion and agency impressions (Walker and Vetter 2016), our participants could still perceive some BFD faces as significantly different only on one social dimension but neutral on the other. Consequently, we also identified unidimensional faces that differ significantly from zero on one social dimension and do not differ significantly from zero on the other social dimension (i.e., high communion, low communion, high agency, low agency).

The results showed that 47.5% of the stimuli (76 out 160 faces) were distributed in the four cells derived from the combinations of the 2×2 SCM matrix. As can be seen in Table 2, most of the faces were perceived as either positive univalent ($n = 36$) or negative univalent ($n = 30$). In contrast, 10 faces were perceived as ambivalent: of these, seven were perceived as low communion–high agency, whereas three were perceived as high communion–low agency. These results confirmed that it was possible to use perceivers' communion and agency impressions of BFD faces to locate them within the SCM. In line with Fiske and colleagues' theorizing (2007) about the halo effect (see also Judd et al. 2005), BFD faces were classified as univalent (i.e., high communion–high agency, low communion–low agency, $n = 66$ out 76, 86.84%) to a greater extent than ambivalent (i.e., high communion–low agency, low communion–high agency, $n = 10$ out 76, 13.16%), consistent with HP2 (see Figure 3 for one example of faces).

Table S1 reports the classification of all 160 BFD faces based on the communion and agency impressions they evoked. Examining the stimuli as a function of gender, we observed a predominance of women among the 36 high communion–high agency faces (27 women) whereas we observed a predominance of men among the 30 low communion–low agency faces (i.e., 20 men).

6 | Discussion

Study 1 had two aims. Firstly, we aimed to confirm that communion signals are predominant over agency when forming evaluations of others. To test this effect, we used BFD faces manipulated on one dimension, assuming that in the case of communion, participants would also infer perceptions of agency. Conversely, we predicted that BFD faces manipulated on the agency dimension would not inform judgements of communion (HP1). Consistent with our hypothesis, the manipulation of
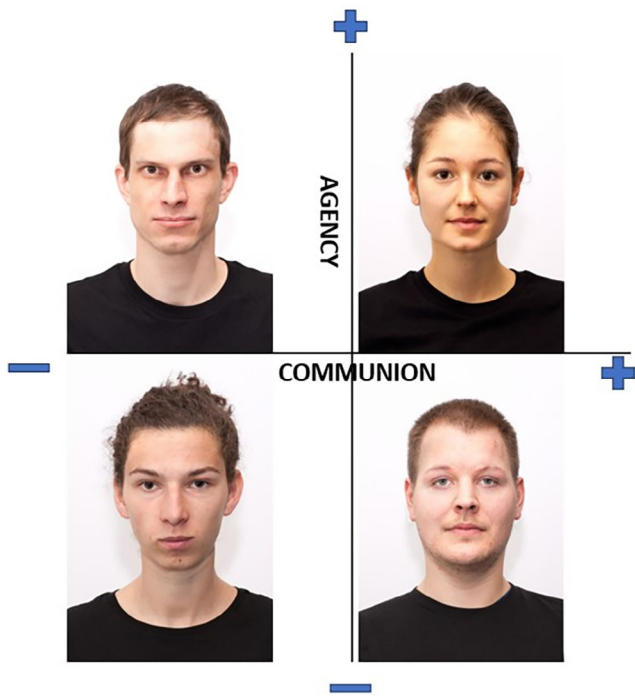
FIGURE 3 | An example of BFD faces classification in SCM cells on the basis of communion (on the horizontal axis) and agency (on the vertical axis) perceptions.

communion facial signals affected both communion and agency impressions, whereas the manipulation of agency facial signals affected only agency impressions.

Secondly, Study 1 aimed to place the BFD faces across the four cells of the SCM cells based on the impressions they evoked. Our results showed that manipulation of the BFD only on one dimension effectively induced both univalent and ambivalent impressions, allowing us to locate 76 faces in one of the four SCM cells. In line with our hypothesis, perceivers formed univalent impressions to a greater extent than ambivalent impressions, resulting in a greater number of faces in the univalent cells rather than in the ambivalent ones.

From a theoretical perspective, our findings showed that whilst in the original BFD development communion and agency vectors were almost orthogonal, as well as communion and agency impressions from faces (Walker and Vetter 2016), when these vectors are applied to novel faces and people are asked to form an impression, the impressions are no longer independent. Furthermore, the database faces are not perceived as neutral on all dimensions except the manipulated dimension, but rather the combined impression reflects any combination of communion and agency, in accordance with the 2×2 SCM (Fiske, Cuddy, and Glick 2007).

7 | Study 2

Study 2 was designed to build upon the findings of Study 1 by investigating how *combined* facial signals of communion and agency impact (a) evaluations of the targets (Research Aim 3), (b) emotions linked with the targets (Research Aim 4) and (c)

behavioural intentions towards the targets (Research Aim 5). This study was pre-registered at https://aspredicted.org/ds6rn.pdf

Regarding the favourability of overall evaluations, when communion and agency are combined in the same face, communion signals should have a stronger impact on the favourability of overall evaluations compared to agency signals, due to the overlap of communion with favourability in face evaluation (e.g., Oosterhof and Todorov 2008). With that in mind, it is reasonable to expect that, regardless of the level of agency signals in faces (i.e., enhanced or reduced), participants should express positive judgements about faces with high levels of communion and negative judgements about faces with low levels of communion. As a consequence, we hypothesized that participants should report more positive judgements about individuals with communion-enhanced faces (i.e., univalent positive: high-communion–high agency; ambivalent: high-communion–low agency) relative to individuals with communion-reduced faces (i.e., univalent negative: low communion–low agency; ambivalent low communion–high agency, HP3).

Regarding emotional reactions, we expected to replicate the pattern described by Fiske et al. (2002) and Fiske, Cuddy, and Glick (2007), such that (a) high communion–high agency faces should evoke greater admiration compared to the other three categories of faces, (b) low communion–low agency faces should evoke greater contempt compared to the other three categories of faces, (c) high communion–low agency faces should evoke greater pity compared to the other three categories of faces and (d) low communion–high agency faces should evoke greater envy compared to the other three categories of faces (HP4).

Regarding behavioural intentions, we reasoned that when perceivers have only facial information available, the valence of communion signals should predominate in guiding behavioural intentions towards the target. Consequently, we hypothesized that participants should be more willing to approach individuals with communion-enhanced faces (high communion–high agency, high communion–low agency) relative to individuals with communion-reduced faces (i.e. low communion–high agency; low communion–low agency, HP5). We expected that this should occur across different social contexts (work, social).

8 | Method

8.1 | Participants

An a priori power analysis was conducted using G*Power 3.1 (Faul et al. 2007), adopting the 'analysis of variance (ANOVA): Within-subject' method. This revealed that at least 180 participants were required to observe a medium effect size ($f = 0.10$), with $\alpha = 0.05$ and power $= 0.80$, with a moderate correlation among the measures. Considering the uncertainty about our observed effect size and the correlations among the measures, we decided to collect a sample larger than the minimum required estimate.

Our sample included 243 participants (51 men, 185 women, 2 participants undergoing gender transition and 5 participants did not respond; *mean age* = 23.74 years, *SD* = 6.75). No participants

failed the attention checks, and no participants were excluded from analyses. Participants were volunteers, and no incentive was given. Additionally, we conducted a sensitivity analysis using G*Power 3.1 (Faul et al. 2007). This analysis showed an effect size threshold of 0.08 for our sample size and design.

All participants provided written informed consent in compliance with the Helsinki Declaration and the European Regulation UE n.679/2016. The research was conducted in accordance with the Research Code of the Italian Association of Psychology.

8.2 | Procedure

To ensure that participants were not exposed to noise or distractions, the experiment was conducted in the lab, using a Qualtrics link. In the first part of the experiment, participants were welcomed and seated in front of desktop or laptop computers. After collection of demographic information (gender and age), participants were shown three faces for each category derived from a 2 (Agency vs. Communion) × 2 (High vs. Low) within-participants design: high communion–high agency (univalent), low communion–low agency (univalent), high communion–low agency (ambivalent), low communion–high agency (ambivalent). In the selection of the 12 faces, we followed two criteria: (a) selecting faces with the highest (or lowest) score on the dimension of interest (as determined in Study 1) and (b) gender balance across the four categories of faces (six men and six women). A list of selected faces is available at the Open Science page https://osf.io/kfuya/?view_only=14333539733f4b21bb1d9cdfe540958c

After the presentation of each face, participants reported their communion and agency impressions, their valence judgements towards the target, along with evoked emotions and behavioural intentions. The faces and questions were presented on the same page. The questions were divided into two blocks: the first block consisted of manipulation checks and valence judgements, while the second block consisted of items assessing emotions and behavioural intentions. Participants proceeded at their own pace. We inserted two attention checks across the questionnaire (i.e., please respond 4).

8.3 | Measures

8.3.0.1 | Manipulation Check. Communion and agency impressions were assessed with three communion-related traits (warm, sociable, happy; a range of Cronbach's α across the four face sets: 0.86–0.91) and three agency-related traits (competent, determined, prepared; a range of α across the four face sets: 0.88–0.91). The traits were selected from research by Tausch, Kenworthy, and Hewstone 2007 (see also Aquino et al. 2016). Participants answered each item on a 7-point scale (1 = *Not at all* to 7 = *Very much*).

8.3.0.2 | Favourability Judgements. Overall favourability judgements were measured through three items adapted from Oliveira et al. (2020): How pleasant is the person in the photo? How desirable is it to be the person in the photo? How bad/good is the person in the photo? (The range of α for the four conditions:

0.86–0.88). Participants responded on a 7-point scale (1 = *Not at all*/*Very bad* to 7 = *Very much*/*Very good*).

8.3.0.3 | Emotions. For each face, participants indicated the extent to which the person in the photo evoked feelings of admiration, envy, pity and contempt. These ratings were made on a 7-point Likert scale, with higher scores indicating greater levels of evoked affect.

8.3.0.4 | Behavioural Intentions. For each face, we asked participants three questions: 'How much would you like to meet the person in the photo?' (nonspecific context), 'How much would you like to go to a party with the person in the photo?' (social context) and 'How much would you like to do a job with the person in the photo?' (work context). Participants responded on a 7-point scale, with higher scores indicating more positive behavioural intentions.

9 | Results

9.1 | Manipulation Checks

To test the effects of our manipulations, we ran a mixed ANOVA with Bonferroni corrections for multiple comparisons. In the ANOVA, the four levels of the within-participant variable were: high communion–high agency faces, low communion–low agency faces, high communion–low agency faces and low communion–high agency faces. As a control, participant gender was included as a between-participant variable.

The results showed that the manipulations were effective. Starting with communion, there was a significant difference in communion impressions among the four face categories, F (3, 234) = 249.61, $p < 0.001$; $\eta p^2 = 0.51$, power $(1 - \beta) > 0.99$. Pairwise comparisons showed that high-communion–high agency faces elicited higher communion impressions ($M = 4.44$, $SD = 0.07$) than both low communion–high agency faces ($M = 2.81$, $SD = 0.07$, mean difference = 1.63; 95% CI [1.41, 1.85], $p < 0.001$) and low-communion–low agency faces ($M = 2.59$, $SD = 0.07$, mean difference = 1.85; 95% CI [1.61, 2.08], $p < 0.001$). Similarly, high communion–low agency faces elicited higher communion impressions ($M = 3.47$, $SD = 0.08$) than both low communion–high agency faces (mean difference = 0.67; 95% CI [48, 0.86], $p < 0.001$) and low-communion–low agency faces (mean difference = 0.89; 95% CI [0.68, 1.10], $p < 0.001$).

Turning to agency, the results showed differences in agency impression among the four face categories, F (3, 234) = 177.71, $p < 0.001$; $\eta p^2 = 0.432$, power $(1 - \beta) > 0.99$. Pairwise comparisons showed that high-communion–high agency faces elicited higher agency impressions ($M = 4.57$, $SD = 0.08$) than both high communion–low agency faces ($M = 3.59$, $SD = 0.09$, mean difference: 0.99; 95% CI [0.80, 1.17], $p < 0.001$) and low-communion–low agency faces ($M = 3.36$ $SD = 0.09$, mean difference: 1.21; 95% CI [1, 1.41], $p < 0.001$). Similarly, low communion–high agency faces elicited higher agency impressions ($M = 4.04$, $SD = 0.09$) than both high communion–low agency faces (mean difference: 0.46; 95% CI [0.26, 0.55], $p < 0.001$) and low-communion–low agency faces (mean difference: 0.68; 95% CI [0.49, 0.87], $p < 0.001$).

TABLE 3 | Mean scores and standard deviation of valence and emotions for high communion–high agency faces (HCHA), high communion–low agency faces (HCLA) low communion–high agency faces (LCHA) and low communion–low agency faces (LCLA).

	HCHA	HCLA	LCHA	LCLA
Valence	3.91 (1.07)	3.01 (0.97)	2.67 (0.92)	2.31 (0.88)
Admiration	3.55 (1.39)	2.25 (1.10)	2.10 (1.07)	1.81 (1.19)
Contempt	1.37 (0.86)	1.64 (1.02)	1.87 (1.24)	2.01 (1.22)
Pity	1.44 (0.90)	2.07 (1.35)	1.71 (1.08)	1.84 (1.14)
Envy	1.52 (1.08)	1.38 (1.08)	1.46 (0.87)	1.36 (0.81)

It is worth noting that high-communion–high agency faces elicited higher communion impressions relative to high communion–low agency faces (mean difference = 0.96; 95% CI [0.76, 1.15], $p < 0.001$). Similarly, low communion–low agency faces elicited lower communion impressions relative to low communion–high agency faces (mean difference = −0.31, 95% CI [−0.36, −0.08], $p < 0.001$). A similar pattern occurred for agency impression. High-communion–high agency faces resulted in a higher agency impression than ambivalent low communion–high agency faces (mean difference = 0.52; 95% CI [0.33, 0.72], $p < 0.001$). Similarly, low communion–low agency faces elicited lower agency impressions relative to high communion–low agency faces (mean difference = −0.22; 95% CI [−0.39, −.05], $p = 0.003$). This suggests that faces conveying concordant facial signals of communion and agency (i.e., univalent faces) elicited higher communion and agency impressions compared to faces conveying discordant facial signals of communion and agency (i.e., ambivalent faces).

Further, our analyses showed a significant effect of participant gender on both communion, $F_{(3, 234)} = 3.07$, $p = 0.028$; $\eta p^2 = 0.013$, power $(1 − \beta) = 0.72$ and agency impressions, $F_{(3, 234)} = 5.89$, $p = 0.001$; $\eta p^2 = 0.025$, power $(1 − \beta) = 0.95$. Male participants attributed higher communion and agency scores than female participants.

9.2 | Valence, Emotions and Behavioural Intentions

To test our HP3 (that communion signals in faces more strongly impact general evaluations than agency signals), we conducted a within-participants ANOVA with Bonferroni corrections for multiple comparisons. The results revealed a significant effect of face categories on the favourability judgements; $F_{(3, 240)} = 361.56$, $p < 0.001$; $\eta p^2 = 0.59$, power $(1 − \beta) > 0.99$; see Figure 4a).

In line with our hypothesis, pairwise comparisons showed that the high-communion–high agency faces were rated more positively (see Table 3) compared to both the low communion–high agency faces (mean difference: 1.23; 95% CI [1.09, 1.37], $p < 0.001$) and the low-communion–low agency faces (mean difference: 1.59; 95% CI [1.42, 1.77], $p < 0.001$). Further, the high communion–low agency faces were rated more positively compared to the low communion–low agency faces (mean difference: 0.70; 95% CI [0.57, 0.83], $p < 0.001$). Crucially, the high communion–low

agency faces were rated more positively compared to the low communion–high agency faces (mean difference: 0.33; 95% CI [0.21, 0.45], $p < 0.001$). As a control, we tested whether evaluations of the low communion–high agency and low communion–low agency faces were more negative than the scale mid-point and not simply less positive (compared with the other categories of faces). This was tested by conducting t-tests comparing the favourability rating of the low communion–high agency faces and low communion–low agency faces with the scale mid-point (4), where we computed a bootstrap of 1000 resamples with a bias-corrected 95% CI As expected, the analysis confirmed the negativity of evaluations for both the low communion–high agency faces, $t_{(242)} = −22.52$; $p < 0.001$; 95% CI [−1.43, −1.20] and the low communion–low agency faces $t_{(242)} = −29.65$; $p < 0.001$; 95% CI [−1.79, −1.57].

These findings are consistent with our expectation that communion signals in faces more strongly impact general evaluations relative to agency signals. Indeed, participants reported more positive judgements towards communion-enhanced faces (i.e., univalent positive: high-communion–high agency; ambivalent: high-communion–low agency) relative to communion-reduced faces (i.e., univalent negative: low communion–low agency; ambivalent low communion–high agency).

To test our HP4 (i.e., greatest admiration for high communion–high agency faces, greatest contempt for low communion–low agency face, greatest pity for high communion–low agency faces, greatest envy for low communion–high agency faces,), for each emotion we conducted a within-participants ANOVA with Bonferroni corrections for multiple comparisons. Starting with admiration, the results showed a significant effect, $F_{(3, 240)} = 260.01$, $p < 0.001$; $\eta p^2 = 0.52$, power $(1 − \beta) > 0.99$ (Figure 4b). Pairwise comparisons confirmed that the high communion–high agency faces evoked the greater admiration (see Table 3) compared with the other three categories of faces, high communion–low agency faces (mean difference: 1.30; $p < 0.001$ 95% CI [1.11, 1.49]), low communion–high agency faces (mean difference: 1.45; $p < 0.001$; 95% CI [1.24, 1.66]) and low-communion–low agency faces (mean difference: 1.73; $p < 0.001$; 95% CI [1.50, 1.95]).

Moving to contempt, the results showed a significant effect, $F_{(3, 240)} = 44.71$, $p < 0.001$; $\eta p^2 = 0.16$, power $(1 − \beta) > 0.99$ (Figure 4b). As predicted, pairwise comparisons confirmed that participants felt more contempt towards the low communion–low agency faces (see Table 3) compared to high communion–high agency faces (mean difference: 0.63; $p < 0.001$; 95% CI [0.45, 0.80]) and the high communion low agency faces (mean difference: 0.36; $p < 0.001$; 95% CI [0.19, 0.53]). Differences between the low communion–low agency face and the low communion–high agency face, although in the predicted direction, were not significant (mean difference: 0.12; $p = 0.136$; 95% CI [−0.02, 0.27]).

Regarding pity, the results showed a significant effect, $F_{(3, 240)} = 36.22$, $p < 0.001$; $\eta p^2 = 0.13$, power $(1 − \beta) > 0.99$ (Figure 4b). Pairwise comparisons confirmed that the high communion–low agency faces evoked the most pity (see Table 3) compared with the high communion–high agency faces (mean difference: 0.64; $p < 0.001$; 95% CI [0.44, 0.81]), the low communion–high agency faces (mean difference: 0.35; $p < 0.001$; 95% CI [0.17, 0.52]) and
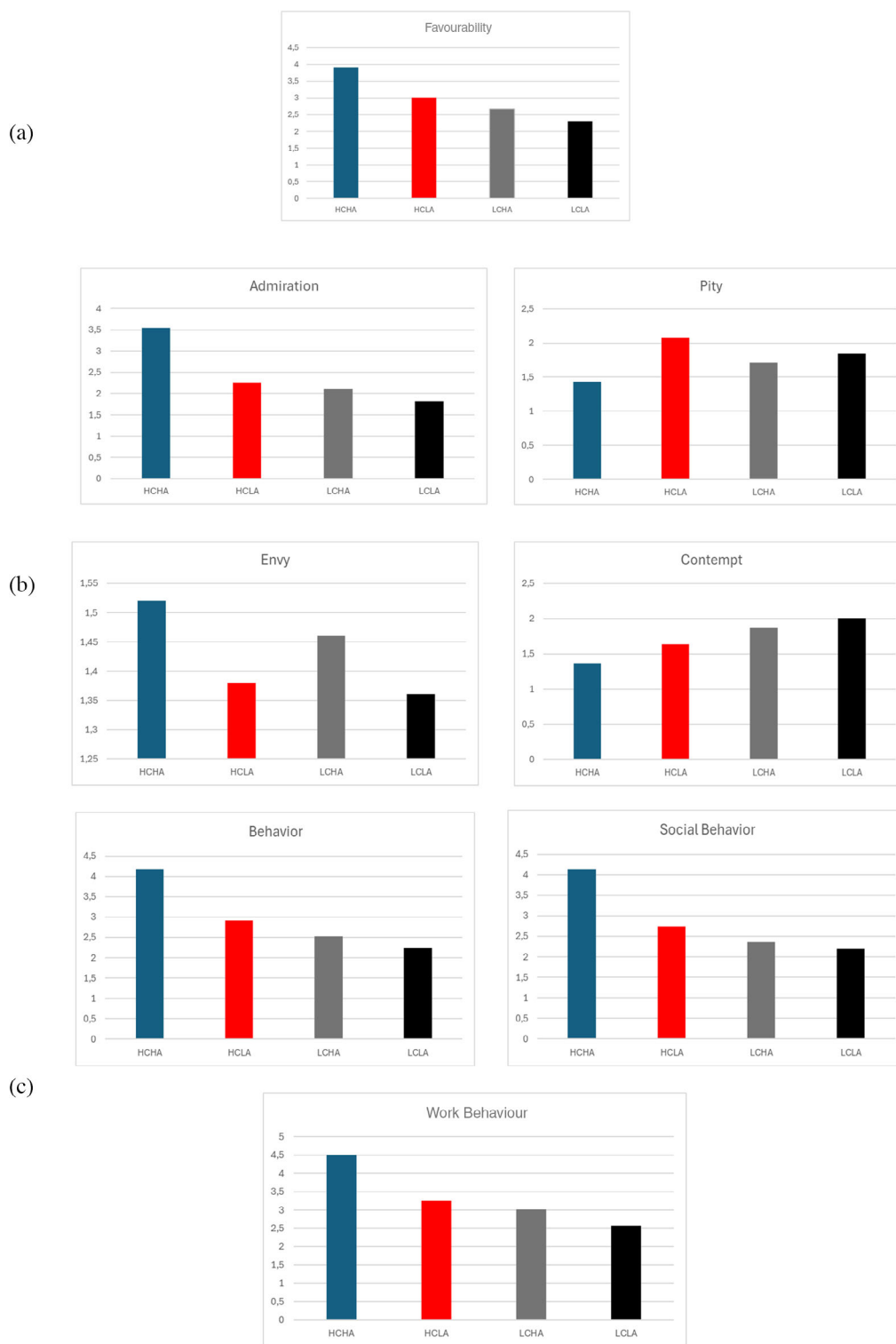
FIGURE 4 | Mean scores of (a) favourability, (b) emotions and (c) behavioural intentions for high communion–high agency faces (HCHA), high communion low agency faces (HCLA) low communion–high agency faces (LCHA) and low communion–low agency faces (LCLA).

the low-communion–low agency faces (mean difference: 0.22; $p < 0.001$; 95% CI [0.05, 0.39]).

Finally, the results showed a significant effect on judgements of envy, $F(3, 240) = 7.54$, $p < 0.001$; $\eta p^2 = 0.03$, power $(1 − \beta) = 0.987$ (Figure 4b). Pairwise comparisons confirmed, as expected, that the low communion–high agency faces evoked more envy

(see Table 3) compared to the low-communion–low agency faces (mean difference: 0.10; $p < 0.001$; 95% CI [0.01, 0.20]), with a marginal effect for the high communion–low agency faces (mean difference: 0.09; $p = 0.07$; 95% CI [0.00, 0.18]). No difference emerged between low communion–high agency faces and high communion–high agency faces (mean difference: −0.05; $p = 1.01$; 95% CI [−0.16, 0.05]).

TABLE 4 | Mean scores and standard deviation of behavioural intentions for high communion–high agency faces (HCHA), high communion–low agency faces (HCLA), low communion–high agency faces (LCHA) and low communion–low agency faces (LCLA).

	HCHA	HCLA	LCHA	LCLA
Nonspecific context	4.17 (1.37)	2.91 (1.22)	2.52 (1.22)	2.24 (1.19)
Social context	4.13 (1.44)	2.73 (1.20)	2.36 (1.20)	2.19 (1.25)
Work context	4.49 (1.43)	3.24 (1.35)	3.01 (1.37)	2.57 (1.31)

Taken together, the ANOVAs largely supported our hypotheses regarding the emotions elicited by the different sets of faces.

To test whether behavioural intentions would differ across the face sets, we conducted within-participant ANOVAs with Bonferroni corrections for multiple comparisons. To test behavioural effects across different contexts, we ran separate ANOVAs for each assessed behaviour (i.e., nonspecific context, social context and work context). Starting with the nonspecific behaviour context, the results showed a significant effect, $F (3, 240) = 310.61$, $p < 0.001$; $\eta p^2 = 0.56$, power $(1 − \beta) > 0.99$ (see Figure 4c). In line with our hypothesis, pairwise comparisons showed that participants expressed a higher intention to meet high-communion–high agency targets (see Table 4) compared to both low communion–high agency targets (difference in mean: 1.65; $p < 0.001$; 95% CI [1.44, 1.65]) and low-communion–low agency targets (difference in mean: 1.93; $p < 0.001$; 95% CI [1.70, 2.16]). Furthermore, as hypothesized, participants expressed a higher intention to meet high-communion–low agency targets compared to both low communion–high agency targets (difference in mean: 0.38; $p < 0.001$; 95% CI [0.23, 0.54]) and low communion–low agency targets (difference in mean: 0.66; $p < 0.001$; 95% CI [0.49, 0.84]).

A similar pattern of findings was observed for social behaviour (i.e., going to a party), $F (3, 240) = 310.61$, $p < 0.001$; $\eta p^2 = 0.56$, power $(1 − \beta) > 0.99$ (see Figure 4c). As expected, pairwise comparisons showed that participants showed that participants expressed a higher intention to go to a party with high-communion–high agency faces (see Table 4) relative to low communion–high agency targets (difference in mean: 1.76; $p < 0.001$; 95% CI [1.55, 1.98]) and low-communion–low agency targets (difference in mean: 1.94; $p < 0.001$; 95% CI [1.69, 2.18]). Furthermore, participants expressed a higher intention to go to a party with high-communion–low agency faces relative to low communion–high agency targets (difference in mean: 0.37; $p < 0.001$; 95% CI [0.21, 0.53]) and with people with low-communion–low agency targets (difference in mean: 0.54; $p < 0.001$; 95% CI [0.35, 0.72]).

Finally, consistent results were found on the work-context item, $F (3, 240) = 220.01$, $p < 0.001$; $\eta p^2 = 0.47$, power $(1 − \beta) > 0.99$ (see Figure 4c). As expected, pairwise comparisons showed that participants expressed a higher intention to perform a job with high communion–high agency faces (see Table 4) relative to both low communion–high agency targets (difference in mean: 1.48; $p < 0.001$; 95% CI [1.24, 1.72]) and low-communion–low agency targets (difference in mean: 1.92; $p < 0.001$; 95% CI [1.67, 2.18]). Furthermore, participants expressed a higher intention to

perform a job with high communion–low agency faces relative to low communion–high agency targets (difference in mean: 0.23; $p < 0.001$; 95% CI [0.04, 0.41]) and low-communion–low agency targets (difference in mean: 0.67; $p < 0.001$; 95% CI [0.48, 0.86]).

Taken together, these findings confirmed our hypothesis that the valence of communion signals predominates in guiding behavioural intentions towards the targets. Further, this was true across different social contexts.[2]

10 | Discussion

Study 2 built upon the findings of Study 1 by investigating how combined facial signals of communion and agency impact evaluations of targets (Research Aim 3), the emotions evoked by targets (Research Aim 4) and behavioural intentions towards targets (Research Aim 5). Starting with evaluations, our findings confirmed our expectations that when communion and agency are combined in the same face, communion signals more strongly impact overall evaluations compared to agency signals. This is consistent with the proposal that there is a strong overlap of communion with favourability in face evaluation (e.g., Oosterhof and Todorov 2008). These findings are particularly relevant in the case of ambivalent faces, given that participants reported a more positive evaluation towards faces that conveyed high communion combined with low agency relative to faces that conveyed high agency combined with low communion.

With reference to emotions, we found support linking communion and agency facial signals with emotions associated with the quadrants of the 2 × 2 SCM (Fiske et al. 2002; Fiske, Cuddy, and Glick 2007). In line with the SCM, our results showed that, compared with the other categories, participants reported the greatest admiration towards the high communion–high agency faces, the greatest pity towards the high communion–low agency faces and the greatest contempt towards the low communion–low agency faces. Regarding our hypothesis that people would feel the greatest envy towards the low communion–high agency faces, our hypothesis was partially supported.

Regarding behavioural intentions, our findings showed that communion facial signals more strongly impact behavioural intentions compared to agency facial signals. These findings are particularly relevant in the case of ambivalent faces, given that participants expressed higher intentions to meet targets whose faces conveyed high communion combined with low agency compared to targets whose faces conveyed high agency combined with low communion. Interestingly, the pattern of results was stable across different social contexts (meeting a person, going to a party, doing a job), consistent with the view that in the absence of a comparative context and without other information available, communion facial signals become a focal cue shaping behaviour.

11 | General Discussion

The present research was designed to test novel questions regarding how people perceive and react to communion and agency in facial signals. In Study 1, we tested whether a face

manipulated either *only* on communion or agency would provide a perceiver with information on the second dimension (Research Aim 1). Our results supported our prediction that differences in communion facial signals would impact both communion and agency judgements, whereas differences in agency facial signals would impact only agency judgements. Furthermore, Study 1 sought to place the BFD faces in the SCM cells based on the impressions they evoke (Research Aim 2), which we were able to accomplish. Not surprisingly, most of these faces were allocated to univalent cells rather than ambivalent cells. This might represent an instantiation of a halo effect (Fiske, Cuddy, and Glick 2007; Judd et al. 2005).

From a theoretical perspective, these findings suggest that when we apply orthogonal vectors of communion and agency to new faces and ask people to form an impression, their impressions are no longer unrelated, as communion impacts impressions of both communion and agency but not vice versa. This asymmetry can be explained by aligning our findings with theoretical frameworks regarding the predominance of communion over agency in modelling impressions based on facial features (Oosterhof and Todorov 2008). From an evolutionary perspective, communion signals are more informative than agency signals for personal and group existence (Brambilla et al. 2011; Scholer and Higgins 2008). In the face domain, communion signals are so relevant that people can use them to infer information about others' agency. Our results have also shown that the combined impression of communion and agency reflects any combination of the to 2 × 2 SCM. Looking at the faces distributed in the 2 × 2 matrix we can make some inferences. As noted also by Walker and Vetter (2009, 2016), the impressions of communion and agency derive from a combination of facial features' configuration and reflectance. Specifically, a face whose mouth seems to resemble a smile and a nonpronounced forehead combined with the brightness of the face signals high communion–low agency. Conversely, a pronounced forehead and a straight face combined with a low brightness signal low communion–high agency.

An alternative explanation for our findings is that, rather than communion facial signals, a general valence dimension (Sayans-Jiménez et al. 2017) accounts for differences in communion and agency impressions. Although this is a possibility, general evaluation shares semantic congruity with communion (in particular with morality; Sayans-Jiménez et al. 2017). Indeed, morality items are a primary contributor to variance in global evaluations (see Oosterhof and Todorov 2008). Furthermore, in the development of the BFD (Walker et al. 2018), the authors specifically manipulated communion (and valence only to the degree that it is part of the concept of the communion). Also presuming an overlap between communion and valence, manipulations are based on communion items, not on valence items (Walker et al. 2018). For these reasons, we are confident that our findings are attributable to communal facial signals.

The predominant role of communion over agency in facial signals has important implications, as shown by Study 2. Here, we showed how combined facial signals of communion and agency impact evaluations of targets (Research Aim 3), the emotions evoked by targets (Research Aim 4) and behavioural intentions (Research Aim 5). Regarding evaluations and behaviour, we expected that when communion and agency are combined in the same face, communion signals in faces should more strongly impact both the favourability of evaluations and behavioural intentions, relative to agency signals. Our results confirmed our hypotheses. From a theoretical point of view, our findings extend our understanding of the different roles that communion and signals play in influencing judgements and behaviours, contingent upon various moderators (see Abele et al. 2021, for a review). Specifically, our results demonstrated that when people assess targets based solely on facial information, communal facial signals play a primary role in guiding their judgements (Brambilla et al. 2013; Van der Lee et al. 2017; Van Prooijen and Ellemers 2015). Further, the behavioural intention measures showed stable effects across different contexts, confirming our expectation that in the absence of a comparative context and without other information available, facial signals of communion are central in shaping individuals' behavioural intentions. From a practical point of view, our results are particularly relevant in the case of ambivalent faces. Here, participants tended to express more positive views about targets whose faces conveyed high communion combined with low agency relative to targets whose faces conveyed high agency combined with low communion.

Regarding emotions, we expected to replicate the same pattern theorized by Fiske, Cuddy, and Glick (2007). Our findings largely confirmed our expectations. Notably, our findings are particularly innovative because, to the best of our knowledge, this is the first demonstration of the model using a combination of communion and agency in faces. Regarding envy, our hypothesis was only partially supported. As expected, envy towards the low communion–high agency faces was greater than envy towards low communion–low agency faces and marginally greater towards the high communion–low agency faces. However, there was no difference in envy for the low communion–high agency face and high communion–low agency faces. This might be due to the high levels of envy linked with both categories of faces. As stated by Fiske, Cuddy, and Glick (2007), envy could represent a defensive strategy that people put in place when they perceive that another person has greater agency than themselves.

Although Study 2 confirmed our expectations about the valence of evaluations, emotions and behavioural intentions, it is worth noting that the mean value of valence and emotion ratings were somewhat low. This is not surprising, as people may be reluctant to express stronger emotions (e.g., pity or contempt) towards unknown targets. Future studies could investigate this possibility in more detail.

An ancillary result of the present research was the confirmation of the utility of the manipulations of facial communion and agency within the original BFD. Our results indicate that participants perceived communal faces as high on this dimension and noncommunal faces as low on this dimension. Similar results were found on perceptions of agency. These results further confirm the strong psychometric properties of the BFD database and, for the first time, in an Italian context. The BFD faces represent a psychometrically sound tool for researchers interested in studying social perception, both in the original unidimensional classification and in the new bidimensional classification.

Finally, we wish to acknowledge some limitations of our research. A first limitation regards the order of presentation of faces in

Study 1, where we presented the four variants of each individual consecutively. This was done to help maximize differences in evaluations, as is often done when presenting variations of persuasive messages (e.g., Aquino et al. 2020; see Briñol and Petty, 2012, for a review). That said, if our choice elicited an order effect, it would affect both communion and agency impressions (and not just one impression) without consequence to our main hypothesis.

Another potential limitation of the present studies is that we focused only on macro-dimensions of communion and agency, without considering their subdimensions (e.g., morality and sociability for communion, dominance and competence for agency (Brambilla et al. 2011). Our choice allowed us to test, for instance, the emotional pattern described by Fiske, Cuddy, and Glick (2007) that did not differentiate between subdimensions. That said, regarding the role of morality dimensions on behaviour (Vázquez et al. 2022), future studies could also investigate the subdimensions of both communion and agency in the BFD.

In sum, our findings offer new evidence regarding processes relevant to first impressions from faces. Returning to the opening example, when you look around during your speed date, a person whose face conveys high communion will likely also convey information about their agency as well. Based on high communion you might be more likely to like that person, feel positive emotions towards them and choose them to go to a party.

Ethics Statement

This research study adheres to ethical guidelines specified in the APA Code of Conduct as well as to the ethical guidelines for the research of the Italian Association of Psychology (https://aipass.org/wp-content/uploads/2023/02/Codice-Etico_luglio-2022.pdf). Ethical review and approval were not required for this type of work, in accordance with the local legislation and institutional requirements.

Consent

Participants provided their written informed consent to participate in this research in compliance with the Helsinki Declaration and the European Regulation UE n.679/2016.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The datasets of both studies along with the syntax are available at the following link: https://osf.io/kfuya/. Furthermore, the codes for the Bayesian analyses are available upon request.

Transparency Statement

For transparency purposes, the datasets of both studies along with the syntax are available at the following link: https://osf.io/kfuya/. Furthermore, the codes of the Bayesian analyses are available upon request. Study 2 was pre-registered at https://aspredicted.org/ds6rn.pdf.

Endnotes

[1] In their taxonomy, Fiske et al. (2007, 2012) used the labels 'warmth' and 'competence'. Warmth and competence are not completely equivalent to communion and agency because, for example, agency consists of a competence and a dominance subdimension.

[2] In an explorative vein, we tested for a potential mediating role of emotions in the relationship between favourability judgements and behaviour. We ran four mediation models (i.e., admiration mediating the relationship between favourability and behaviour for high communion–high agency faces, pity mediating the relationship between favourability and behaviour for high communion–low agency faces, envy mediating the relationship between favourability and behaviour for low communion–high agency faces and contempt mediating the relationship between favourability and behaviour for low communion–low agency faces). To test our mediations, we relied on PROCESS (Hayes 2017), with a resample of 1000 bootstraps. Our analyses showed a significant direct effect of favourability judgements on behaviour (direct effect for high communion–high agency faces = 0.21; $p < 0.001$; 95% CI [0.13, 0.32]; direct effect for high communion–low agency faces = 0.87; $p < 0.001$; 95% CI [0.76, 0.99]; direct effect for low communion–high agency faces = 0.82; $p < 0.001$; 95% CI [0.70, 0.94]; and direct effect for low communion–low agency faces = 0.87; $p < 0.001$; 95% CI [0.74, 0.95]). We found significant partial mediation of admiration on the relationship between favorability and behavior for high communion–high agency faces, $F (2, 240) = 173, 94, p < .001, R^2 = .60$, indirect effect = .17, 95% C.I. [.10, .25]. We also found significant partial mediation of envy on the relationship between favorability and behavior for low communion–high agency faces, $F (2, 240) = 123, 36, p < .001, R^2 = .50$, indirect effect = .02, 95% C.I. [.02, .10]. Finally, we found marginal partial mediation of contempt on the relationship between favorability and behavior for low communion–low agency faces, indirect effect = .01, 95% C.I. [-.01, .03].

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Supporting Information

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